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ABSTRACT

A COMPARISON OF THE EFFECTIVENESS OF THE PROJECT AND COOPERATIVE METHODS OF INSTRUCTION ON SELECTED COMPETENCIES IN DISTRIBUTIVE EDUCATION AT THE SECONDARY LEVEL

by Edward T. Ferguson, Jr.

Purpose of the Study

This study was undertaken to compare the effectiveness of the project and cooperative methods of teaching high school distributive education. The study focused upon the teaching of two competencies in distributive education: economic understanding and sales comprehension. To more accurately compare the effectiveness of the two methods, the project method in eleventh-grade distributive education classes and the cooperative method in twelfth-grade distributive education classes, the variables of the socioeconomic background, age, sex, and prior achievement of the students and teachers' attitude were also considered.

Procedures

The sample for the study consisted of 733 students in ten Michigan high schools. Each school contained four groups of students: an eleventh-grade project method distributive education class, an eleventh-grade English or

social science control class, a twelfth-grade cooperative method distributive education class, and a twelfth-grade English or social science control class.

The five types of data gathered were (1) socioeconomic status information about the school communities and the students in the study; (2) scores on the Sequential Tests of Educational Progress, Reading, Form 2A, as a measure of students' prior achievement; (3) scores on the Test of Economic Understanding, Forms A and B (pre- and post-tests), the Test of Sales Aptitude (A Test For Measuring Knowledge of Basic Principles of Selling), and the Sales Terms Test (post-tests); (4) scores on the Minnesota Teacher Attitude Inventory for the ten distributive education teachers in the study; and (5) personal data on all the students and the distributive education teachers.

The three statistical procedures used in the analysis of the data were correlations analyses, t-tests, and analyses of covariance.

Major Findings

1. The control (non-distributive education) groups, on the whole, performed as well as or better than the two distributive education groups on the tests of economic understanding and sales comprehension. After initial differences were adjusted for through the analyses of covariance, the

difference in the scores of the control groups and their respective distributive education groups were not significant. The differences in the scores of the cooperative method classes and the project method classes on the tests of sales comprehension were significant, with the cooperative method classes scoring higher. There was no significant difference between the scores of the two distributive education groups on the test of economic understanding.

2. There was a positive correlation between student prior achievement, as inferred from test scores achieved on the STEP-Reading, and scores students attained on standardized tests of economic understanding and sales comprehension. However, there was no significant difference on the reading comprehension test between the scores of the two distributive education groups.

3. There was no statistically significant correlation between students' socio-economic status, students' age, students' sex, or teachers' attitude inventory scores and scores students attained on the standardized tests measuring reading comprehension, economic understanding, and sales comprehension.

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By
Edward T. Ferguson, Jr.

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CHAPTER I

THE PROBLEM OF THE STUDY

Introduction

In his concern for the status and direction of American education, the late President John F. Kennedy delivered a message to Congress in 1961 in which he called for the establishment of an advisory group to review and evaluate existing federal commitments to vocational education. Thus, in October 1961 the Panel of Consultants on Vocational Education was officially appointed by the Secretary of Health, Education, and Welfare. The 1963 report of the Panel suggested several changes for existing programs of vocational education. Foremost among these was a recommendation that vocational education programs be made available to more students in the secondary schools.¹ The members of the Panel recommended, specifically in the field of distributive education, the development of pre-employment in-school training programs which would be offered in addition to the existing cooperative work-study programs. The members implied that

¹U. S. Department of Health, Education, and Welfare, Office of Education, Education for a Changing World of Work, OE 80021 (Washington: Government Printing Office, 1963), p. 226.

this was desirable to make needed vocational instruction available to more students.²

That same year, a report entitled "The Federal Government and Education," issued by the Committee on Education and Labor of the House of Representatives, stated that distributive education was "handicapped by the legislative limitation which restricts training to persons sixteen years old who are already employed in distributive work."³

In his keynote speech at the National Clinic on Distributive Education in October 1963, John Beaumont, Director of the Distributive Education Branch of the United States Office of Education, made reference to the impact of the report of the Panel of Consultants and the House report, stating:

These reports and the proposed legislation challenge distributive educators to think first of people in organizing programs for the distributive occupations. . . . The major concern in the past history of distributive education has been with an extension program. Instruction has been limited to employed persons. . . . There is, however, this emerging opportunity to consider the needs of people in the developing occupational mix. Further, there is the added challenge to prepare individuals for the initial job. In this context, employment would follow education, rather than as at present precede education.⁴

²Ibid., p. 227.

³U. S. Congress, House Committee on Education and Labor, The Federal Government and Education, 88th Congress, 1st Session, 1963, p. 47.

⁴John A. Beaumont, "The Emerging Program of Distributive Education," (Address before the National Clinic on Distributive Education, Washington, D. C., October 14, 1963) (USOE Mimeo Printing), pp. 7-8.

The "proposed legislation" to which Beaumont referred in his address became the Vocational Education Act of 1963 (PL 88-210), which embodied many of the recommendations in the report of the Panel of Consultants and the House report. The Act specifically provided for the establishment of pre-employment, in-school preparatory training programs in distributive education. Such programs in distributive education now, under the Act, are available to unemployed youth over fourteen years of age.⁵

Mary V. Marks, USOE Program Specialist in Distributive Education, in a paper delivered at the 1963 National Clinic, made first mention of how instruction would be provided in the newly emerging programs of pre-employment education in distribution and marketing. She stated:

With the evidence mounting that learning which is to be assessed by performance is best achieved through participation activities, there is ample justification for us to continue to require these in the methodology of distributive education. But let us not be limited to cooperative training on a school-work schedule as we now know it. Let us find other ways to provide for experiences to develop and consolidate employment qualifications at entry and career levels.⁶

Marks then suggested and described another approach to the teaching of distributive education:

⁵U. S. Congress, Senate Committee on Labor and Public Welfare, Selected Education Acts of 1963, 88th Congress, 1st Session, 1963, p. 97.

⁶Mary V. Marks, "The Vocational Approach in Education for Distribution," (Address before the National Clinic on Distributive Education, Washington, D. C., October, 1963) (USOE Mimeo Printing), p. 3.

In addition to the cooperative method of training, participation activities . . . also include group or individual projects which may be used by the instructor to encourage vocationally-centered learning. These may take place in a specially-equipped classroom, in a field assignment of narrow scope, and in situations simulating experiences of varying degrees of sophistication related to employment opportunities.⁷

Also at this 1963 National Clinic, members of Task Force I on High School Age Youth recognized the need for additional program development. They encouraged "further program expansion . . . through the development of additional plans such as . . . using the vocational approach with simulated work experience. . . ."⁸

More recently, the United States Office of Education has formally endorsed the project method of instruction as a vehicle for providing in-school preparatory distributive education, as it is provided for in the Vocational Education Act of 1963. At a meeting of the National Association of Distributive Education Teachers in December 1965, Mary V. Marks reported that the project method as a teaching device "seeks the same learning outcomes as does the cooperative method. . . ."⁹ Therefore, Marks concluded,

⁷Ibid., pp. 4-5.

⁸National Clinic on Distributive Education, Report of Task Force I: High School Age Youth (Washington, D. C., 1963), p. 5.

⁹Mary V. Marks, "The Project Method in Action," (Address before the National Association of Distributive Education Teachers, American Vocational Association Convention, Miami Beach, Florida, December 9, 1965) (USOE Mimeo Printing), p. 2.

it is the objective of the project method of instruction to accomplish goals similar to those of the cooperative method of instruction.

It can be seen that the legislation and interpretation of this legislation have provided the distributive educator with another method of teaching distributive education and maintaining a vocational approach. In her speech in December, 1965, Marks put official endorsement of the USOE on the project method of instruction in distributive education. She stated:

. . . we are designating the project method and the cooperative method as the two broad categories of participation activities used by distributive educators to prepare students for employment in distribution and marketing. . . . We rely on you to prove that distributive education is ready to incorporate into its program a new method of vocationalizing preparatory instruction.¹⁰

Before any new method of teaching can be widely adopted, it must be tested and evaluated as to its effectiveness and feasibility as an educational tool for the classroom. The project method, if it proves efficient in achieving the purposes of pre-employment training, will provide answers to several problems persistently associated with the cooperative method. Employing in-school instruction as contrasted to dependence upon on-the-job training, the project method would:

1. permit a longer period of development within a more fully controlled environment for the immature student.

¹⁰Ibid., p. 7.

2. offer pre-employment training for the student whose physical development or appearance makes on-the-job training during high school inappropriate.
3. allow longer time and helpful experiences for the student whose vocational choice is undefined.
4. accommodate larger numbers of students in communities which have limited numbers of on-the-job training stations.
5. reduce the cost in time and dollars of providing pre-employment vocational preparation. (Teachers can accommodate more students by having larger classes and more class periods, thus decreasing the teacher-pupil contact cost.)

Statement of the Problem

This study is an analysis and comparison of selected areas of achievement by eleventh-grade distributive education students who received instruction through the project method as opposed to twelfth-grade distributive education students who received instruction through the cooperative method.

The investigation was intended to test the hypothesis that: the eleventh-grade project method of instruction for preparatory distributive education can produce outcomes in student achievement on tests of economic understanding and sales comprehension as high as those now being obtained through the cooperative method of instruction in the traditional twelfth-grade distributive education class.

Specifically, the problem which this study investigated may be posed as several questions which consider the association between these items:

1. Are the results on certain standardized tests in sales comprehension significantly different for eleventh-grade distributive education students who have been taught by the project method of instruction and twelfth-grade distributive education students who have been taught by the cooperative method of instruction?

2. Are the results on certain standardized tests in economic understanding significantly different for eleventh-grade distributive education students who have been taught by the project method of instruction and twelfth-grade distributive education students who have been taught by the cooperative method of instruction?

3. Of what importance is students' level of prior achievement in determining the significance of students' scores on standardized tests in sales comprehension and economic understanding?

4. Of what importance are the socio-economic status, age, and sex of students in determining the significance of students' scores on standardized tests in sales comprehension and economic understanding?

5. Of what importance is teacher attitude in determining the significance of students' scores on standardized tests in sales comprehension and economic understanding?

Purpose of the Study

It is believed that the findings of this study might
(1) contribute to a better understanding of the merits of

the project and cooperative methods of instruction, (2) provide certain kinds of information about distributive education students in relation to non-distributive education students, and (3) identify procedures and problems in measuring the competencies in distributive education.

Setting of the Study

There existed at Michigan State University the Research and Development Program in Vocational-Technical Education¹¹ which was engaged in a distributive education curriculum development project. The project involved seventeen high schools, of which ten were used for this research study. Four groups in each of the ten schools were used in the study: an eleventh-grade distributive education project method class, a twelfth-grade distributive education cooperative method class, an eleventh-grade non-distributive education class (English or social science), and a twelfth-grade non-distributive education class (English or social science). Both groups of distributive education and the

¹¹The Research and Development Program in Vocational-Technical Education at Michigan State University, under the direction of Dr. Peter G. Haines and supported by funds from USOE grants, Michigan State University, and the Michigan State Department of Education, was established in 1965. The basic aim of the R&D Program is to improve vocational-technical education within the State of Michigan, as well as regionally, by the establishment of contractual clinical schools which serve as sites for pilot and demonstration programs in vocational-technical education. In January 1966 the Distributive Education Pilot School Project was initiated with a selection of seventeen participating high schools within Michigan. The researcher was the R&D Project Leader for the curriculum development project in distributive education.

eleventh- and twelfth-grade students in the non-distributive education classes, a total population of 733 students, were administered, in pre- and post-test situations, standardized tests of reading comprehension, economic understanding, and sales comprehension. Evaluating students' learning of the economic understanding and sales comprehension competencies was considered an effective means of examining each of the two methods of instruction in distributive education.

Importance of the Study

Neither the project nor the cooperative methods of instruction in distributive education has been subjected to empirical testing regarding their effectiveness in the teaching of the various competencies essential to a successful distributive worker. Because of the absence of sufficient research and literature on the relative effectiveness of the project and cooperative methods as devices in teaching high school distribution and marketing, it was decided that a study concerned with an analysis and comparison of these two methods of teaching could contribute to the existing knowledge in the field of distributive education as well as identify problems for future research in this area. There is too a need to investigate the project method as a means of teaching high school distribution and marketing in light of the recent federal legislation and the endorsement of the USOE of this method as a way to provide in-school preparatory distributive education.

Basic Assumptions

Underlying the study were the following basic assumptions:

1. That the competencies of selling and economic understanding can be indirectly measured through student performance on standardized tests.
2. That student performance on these tests represents a valid index of the effectiveness of some areas of instruction in distributive education.
3. That student performance on a standardized reading comprehension test is a valid indication of students' prior achievement.
4. That the effects of maturation can be statistically controlled for by the inclusion of two control groups, one for each grade level.
5. That socio-economic data gathered from students and school administrators are accurate representations of the socio-economic status of the students and schools included in the study.
6. That, though students' prior work experience may have an influence, the prior work experience was essentially the same for all students in the study who may have worked.
7. That teacher attitudes can be measured as a basis for determining the correlation, if any, these attitudes have with student achievement.

8. That each of the teachers performed with equal effectiveness in teaching by the two methods of instruction.

Delimitations

The delimiting factors established for this study were as follows:

1. The data collected were drawn from ten high schools located in the State of Michigan. The same teacher in each school taught both the project method and the cooperative method classes.
2. The data accepted for analysis were limited to the scores on standardized tests and socio-economic indices gathered by student information data sheets and interviews with school administrators.
3. Measures of pupil achievement were limited to scores on tests of the competencies of economic understanding and sales comprehension.
4. Measures of prior achievement of students were limited to scores on standardized tests of reading comprehension.
5. There were no selection procedures for including or excluding students from either the project method or the cooperative method classes. There were also no measures of the variability among individuals--personality, attitudes, interests--in the study.

Definition of Terms

In order to convey consistent meanings, applicable to this study, the terms presented below have been defined.

Competency. Skill, knowledge, or understanding necessary for the successful performance of those tasks which compose the job.

Cooperative Method. The coordination of classroom instruction with a series of on-the-job learning experiences related to each student's occupational objective.

Cooperative Plan. An organizational pattern for preparatory vocational education, in which regularly scheduled part-time employment is coordinated with classroom instruction that gives students an opportunity to apply theory in practice, while developing competencies through training on a job related to their occupational objectives.

Distributive Occupation. ". . . an occupation that is followed by proprietors, managers, or employees engaged primarily in marketing or merchandising of goods or services. These occupations are commonly found in various [kinds of] business establishments such as retailing, wholesaling, manufacturing, storing, transporting, financing, and risk-bearing."¹²

¹²U. S. Department of Health, Education, and Welfare, Office of Education, "Rules and Regulations," Administration of Vocational Education, Bulletin No. 1 (Washington: Government Printing Office, 1966), p. 44.

Project. "A significant, practical unit of activity having educational value and aimed at one or more definite goals of understanding; involves investigation and solution of problems and, frequently, the use and manipulation of physical materials; planned and carried to completion by the pupils and teacher in a natural, 'real-life' manner."¹³

Project Method. The coordination of classroom instruction with a series of individually designed learning activities or projects related to a student's occupational objective.

Project Plan. An organizational pattern for in-school, pre-employment, preparatory vocational instruction in distributive education, which involves a regularly scheduled series of individually designed activities which simulate the work environment and are correlated with classroom instruction to give students an opportunity to apply theory to simulated practice while developing competencies through projects simulating work situations and related to their occupational objectives.

Organization of the Presentation

Chapter II consists of a review of literature pertinent to the problem under study. No reports of empirical

¹³Carter V. Good, (ed.), Dictionary of Education (New York: McGraw-Hill Book Company, 1959), p. 314.

studies of the project and cooperative methods were found. Therefore, the review of the literature covers: (1) the development and use of the cooperative method of instruction, (2) the development and use of the project method of instruction, with focus on distributive education.

Chapter III outlines the specific procedures involved in conducting the study, as follows: (1) the nature of the experimental instruction, (2) the data collected, (3) processing of the data, (4) procedures of analysis of the data.

Chapter IV presents the findings of the study and includes: (1) test results and information on student achievement and the collateral data, (2) findings from calculations of simple correlations and t-tests, (3) interpretation of the analyses of covariance, (4) tests of the stated hypotheses and summary.

Chapter V concludes the presentation with the summary of the major findings, conclusions, and recommendations of the study.

CHAPTER II

REVIEW OF RELATED LITERATURE¹

This chapter will be primarily a summary of the historical development and the philosophical and psychological bases of the cooperative and project methods of instruction in distributive education. This study has revealed no reports of empirical research comparing these two methods of instruction.

This review is divided into two major sections:

(1) the cooperative method of instruction and (2) the project method of instruction, as they have developed in the United States.

The Cooperative Method of Instruction

Early Educational Philosophers and Their Thoughts on Practical Education

It would be difficult to assess the ideas and philosophies of those men who, in their lifetimes, have directly

¹Much of the material in this chapter was initially obtained from the library search conducted by William Woolf and Donald Pettit, graduate research assistants in the Research and Development Program in Vocational-Technical Education at Michigan State University. Their compilation of data is reported in A Selected And Annotated Bibliography Related to Cooperative and Project Methods in Distributive Education (Research and Development Program in Vocational-Technical Education, Department of Secondary Education and Curriculum, Michigan State University, East Lansing, Michigan, April 1967).

or indirectly exerted contributory influences on the development of cooperative education. When a search is made to discover philosophical and psychological bases for the cooperative method of instruction, several early philosophers stand out for their insistent urging that education be made more life-like and practical. To them is owed the conceptual framework for present-day vocational education. Before cooperative education could develop as a method of instruction, educators had to come to accept the theory of vocational education as an integral part of the educational enterprise. Among these early philosophers who recognized the value of practical activity as an integral and functioning part of organized education were Comenius, Locke, Francke, Rousseau, Pestalozzi, Fellenberg, Froebel, Woodward, Dewey, along with many others.

Comenius (1592-1670) felt that, besides being able to read and write their native language, all young people should have a knowledge of the trades and occupations of life. He apparently had an unusual understanding for his time of the development and needs of youth. He felt that the manual arts and crafts could be closely related to the spontaneous activities and interests of children. These arts were included in his "Pansophic curriculum" with the following emphasis:

There is nothing in Heaven or Earth, or in the waters, nothing in the Abyss under the earth, nothing in the Human body, nothing in the Soul, nothing in Holy Writ, nothing in the Arts, nothing in Economy,

nothing in Polity, nothing in the Church of which the little candidates of Wisdom shall be wholly ignorant.²

As head (rector) of the Gymnasium at Lissa, Poland, in 1636, Comenius had ample opportunities to try his ideas in the classroom and to direct his attention to the improvement of teaching methods and materials.³

Locke's (1632-1704) idea of the subject matter of education was somewhat different from that of Comenius. Locke maintained continually and persistently that each child was to be educated (or trained?) for his place in life, and not for some other. He pointed out this principle of education for use in the following passage from his work Some Thoughts Concerning Education:

. . . Could it be believed, unless we had everywhere amongst us examples, of it, that a child should be forced to learn the rudiments of a language which he is never to use in the course of life that he is designed to, and neglect all the while the writing a good hand and casting accounts, which are of great advantage in all conditions of life, and to most trades indispensably necessary? But though these qualifications, requisite to trade and commerce and the business of the world, are seldom or never to be had at grammar-schools, yet thither not only gentlemen send their younger sons, intended for trades, but even tradesmen and farmers fail not to send their children, though they have neither intention nor ability to make them scholars.⁴

²The Great Didactic of John Amos Comenius, quoted in Frederick Eby and Charles F. Arrowood, Development of Modern Education (Englewood Cliffs, N.J.: Prentice-Hall, 1941), pp. 270-271.

³Ernest E. Bayles and Bruce L. Hood, Growth of American Educational Thought and Practice (New York: Harper & Row, 1966), p. 24.

⁴Ibid., pp. 54-55.

Francke (1663-1727) may also, to a certain extent, be considered as an early contributor to the acceptance of the vocational aspect of education and hence to the development of cooperative education. Though his emphasis was more in the nature of work as an extra-curricular activity, in his school for young nobles he provided:

. . . equipment for courses in mechanics, glass blowing, copper engraving, wood carving, and health guidance; a natural history museum and dissecting apparatus; an herbarium; and physical and chemical laboratories.⁵

While he apparently intended that these practical extra-curricular experiences had no significance for the vocational preparation of his students, nevertheless the fact that he considered such training important enough to provide them, albeit on an extra-curricular basis, is worthy of note.

The impracticality of the education and training which children received at home and in school stirred Pestalozzi (1743-1827) more than most of the other early philosophers. His concern for the plight of the lower classes, a concern very much in evidence today, challenged him to search out some way to improve their status through education. Pestalozzi felt that a combination of work and schooling would be a solution to the deplorable educational situation. Believing in the now time-honored phrase "we learn by doing," he pointed out:

⁵Eby and Arrowood, p. 336.

. . . I know how useful the common needs of life are in teaching men the relations of things, in bringing out their natural intelligence, in forming their judgment, and in arousing faculties which, buried, as it were, beneath the coarser elements of their nature, cannot become active and useful till they are set free. It was my object then to arouse these faculties, and bring them to bear on the pure and simple circumstances of domestic life, for I was convinced that in this way I should be able to form the hearts and minds of children almost as I wished.⁶

To accomplish this aim and test his theory, Pestalozzi established an orphanage for eighty homeless children, in which he proposed to:

. . . teach all the children to read, write, and count; and the boys the chief occupations of farming and tillage as far as I can, the care of meadows and pasture; the different kinds of grasses, care of fruit and forest trees, & c. The care of the house also will teach the girls gardening, domestic work and sewing.

The occupation for winter will chiefly be the spinning of cotton.⁷

To Pestalozzi then should go much credit for the recognition of the urgent need for practical training. One can also see in his beliefs and practices the beginnings of comprehension of the feasibility of combining work and education.

The influence of Pestalozzi's ideas on education was far-reaching; his methods were adopted in many countries. In Germany, Baron von Fellenberg (1771-1844) developed a school at Hofwyl which was very much in keeping with

⁶Eby and Arrowood, p. 668.

⁷Bayles and Hood, pp. 99-100.

Pestalozzi's philosophy. Fellenberg especially emphasized the need for vocational preparation in all levels of society.

In addition to farming, there were established printing, tailoring, shoemaking, and other lines of work. With this practical training went the education of the common school branches.⁸

Fellenberg's school exercised as great an influence as that of Pestalozzi, and both were instrumental in the popularization of agriculture education.⁹

Of course the great American contributor to the acceptance of the idea of "learning by doing" as an important factor in the curriculum of the schools was John Dewey (1859-1952). Direct experience, Dewey urged, should be the basis of all education. The Dewey school in Chicago (1897-1905) emphasized the practical activities of life outside the school as an integral part of the curriculum. In the school the children did things with their hands, such as gardening, weaving, and carpenter work. Dewey stated:

The first approach to any subject in school, if thought is to be aroused and not words acquired, should be as unscholastic as possible. To realize what an experience, or empirical situation means, we have to call to mind the sort of occupations that interest and engage activity in ordinary life. And careful inspection of methods which are permanently successful in formal education, whether in arithmetic or learning to read, or studying geography, or learning physics or a foreign language, will reveal that they depend for their efficiency upon the fact that they go back to the type of situation which causes reflection out of school in ordinary life. They give the pupils something to do,

⁸Eby and Arrowood, p. 668.

⁹Ibid.

not something to learn; and the doing is of such a nature as to demand thinking, or the intentional noting of connections; learning naturally results.¹⁰

It must be pointed out that what the early educational philosophers were discussing above was not vocational education as it is seen today. But it was an acceptance of the theory that schools and colleges did have a role in something other than general education. The concept of vocational training as a part of the total school framework, then, became a development of man's belief that education must serve a vocational as well as academic end. It was from these philosophical threads that proponents of the cooperative method of instruction wove the fabric of what was to become an accepted segment of educational practice.

Early Development of the Cooperative Method

The development of cooperative education as it has grown in the United States to its present-day proportions is said to owe its initial impetus to Dean Herman Schneider of the College of Engineering of the University of Cincinnati. As early as 1899, while a student at Lehigh University, Schneider was contemplating the cooperative method of education. He began his teaching career in 1903 at the University of Cincinnati, which inaugurated a cooperative system of education in 1906. Reporting Schneider's early struggles with the idea,

¹⁰John Dewey, Democracy in Education (New York: Macmillan Co., 1916), p. 181.

Clyde Park wrote:

Schneider's own dissatisfaction with instructional methods was not his only reason for thinking about the gap between theory and practice. He had talked with many employers of engineers in order to learn their views of the effectiveness of engineering education. These men said that the young engineers they employed might have book learning, but that generally they could not put their knowledge to use until after they had gone through a discouraging period of probation. In other words, the young men did not know where and how to take hold. He wondered whether students could not be given sufficient acquaintance with industry to vitalize their professional studies and to fit them for immediate usefulness upon graduation. As he saw it, the practical question was: 'How could theoretical knowledge and first-hand experience be hitched together?'

One evening after teaching hours, Herman Schneider was pondering this question while he walked across the Lehigh University campus. Suddenly he was started out of his reverie by the blast of a Bessemer converter at a nearby steel plant. In that moment an idea came to him that offered a possible solution to his problem. Here was a huge modern industry existing side by side with a university--a vast industrial laboratory filled with the latest, most expensive equipment made to order for his scheme of training. At the end of their college course many young men now studying in Lehigh University would find employment in these steel mills, as other graduates had done before them. Why not have this employment begin on a part-time basis while they were still in college, and make the work a recognized part of their training? Swiftly his imagination followed out the possibilities of the scheme. He went home in an exalted frame of mind and sat up late, mapping out details of an educational project that became increasingly absorbing as he considered its far-reaching implications.¹¹

Although Schneider's most direct influence was felt on the post-secondary level in technical schools, colleges, and universities, his work and his ideas were also indirectly

¹¹Clyde Park, Ambassador to Industry (New York: Bobbs-Merrill Co., 1943), p. 44.

influential on the secondary level. It was Schneider's beliefs and practices as he expressed them that greatly influenced the first high school cooperative program at Fitchburg, Massachusetts, for:

. . . at a meeting held in New York City in the spring of 1908, Professor Herman Schneider, Dean of the College of Engineering of the University of Cincinnati, presented to a group of metal manufacturers gathered from all parts of the country the plan of cooperative industrial education used successfully under his direction, by which arrangements had been made with several shops of Cincinnati to give the students in engineering the larger part of the practical training required for graduation. Among those who were present was Mr. Daniel Simonds, a manufacturer from Fitchburg, Massachusetts, a broadminded and public-spirited citizen of one of the most successful industrial centers of Massachusetts. Immediately he saw the possibility of adapting the plan to his home town, and through it of solving the problem of industrial education for boys and his city.

Mr. Simonds returned to Fitchburg and presented his ideas to the school authorities. The feasibility of the plan was conceded, and a committee was appointed to inspect the work in operation in Cincinnati. The committee reported in favor of the immediate adoption of a similar plan in connection with the high school of Fitchburg. Several employers of skilled labor in Fitchburg came forward to assist in the movement and to give that phase of cooperation without which the course would be impracticable, namely, the use of their shops and machinery.¹²

In 1905, also while Schneider was developing his ideas for cooperative education, Mrs. Lucinda Wyman Prince, through her work with the Women's Educational and Industrial Union of Boston, Massachusetts, became interested in the vocational training needs of girls and started a class of

¹²Matthew R. McCann, The Fitchburg Plan of Cooperative Industrial Education (Washington: Government Printing Office, 1913), p. 36.

eight girls whose lack of training kept them unemployable. Upon completing the course, the girls took sales positions with the Boston Stores department store. Because of the success of this first class, Mrs. Prince continued offering such training.

After doing everything possible to interest merchants in the value of organized training which would include work in a store as a sales person, and after many interviews with store executives, Mrs. Prince secured a promise from William Filene's Sons Company to allow the students she was training to secure practical store experience by working in the store on Mondays. Organized training of store workers in this country today is a direct outgrowth of a desire on the part of the Women's Educational and Industrial Union of Boston to aid working girls and women by sponsoring attempts on the part of these workers to advance themselves educationally, industrially, or socially.¹³

As she continued to work with girls in her classes, Mrs. Prince began to recognize the need for more practical experience in stores. She then developed the idea of a definite alternation of class work with store experience.

Accordingly, she arranged a schedule with the advisory committee under which students attend the school each morning from 8:30 to 11:00 and each afternoon from 4:30 to 5:30 spending the intervening hours in the stores. For this half-time work the girls received three dollars a week, a higher wage than formerly given students.

Mrs. Prince was, therefore, responsible for the origination and early promotion of cooperative education for retail store clerks on both the secondary and college level.¹⁴

¹³Kenneth B. Haas, Cooperative Part-time Retail Training Programs (Washington: Government Printing Office, 1939), p. 2.

¹⁴Ibid., pp. 3-4.

The influence of Mrs. Prince on distributive education in the Boston Public Schools was to be felt for many years. In 1912, through her efforts, the first retail training cooperative program began.¹⁵ By 1914 nine high schools in Boston were offering instruction in distributive education combined with a cooperative occupational experience. In 1921 alternate-week programs were established, enabling Boston school students to spend a longer period of time on the job. By 1927 the half-day program of occupational experience as it is known today was a reality.¹⁶

In 1931 the first signs of evaluation of the cooperative method became evident. A study conducted by Professor P. Evans Coleman of the marketing department of the University of Detroit showed that cooperative commercial students progressed very well on the job and were well able to find areas of specialization in their work situations.¹⁷ Coleman's study represented a follow-up for five years of a group of eighty-five youths who were graduated in 1924 from junior high schools that had no cooperative relationships

¹⁵T. Carl Brown and William B. Logan (eds.), "50 Years of Progress in Distributive Education," American Vocational Journal, XXXI (December, 1956), 57.

¹⁶Helen M. Moran, "Distributive Education in the Boston Public Schools," The Balance Sheet, XL (January, 1959), 211-213.

¹⁷P. Evans Coleman, "Cooperation: The New Tie Between Education and Industry," Nation's Schools, VIII (August, 1931), 49-52.

with industry, in contrast to a five-year cooperative experience undertaken by sixty commercial students from the University of Cincinnati.

Osgood reported in 1932 that New York was experiencing favorable results with their high school cooperative programs. Students were working the week-in, week-out method (a concept in vocational education which denotes that students are paired so that one can work while the other is in school, alternating a week in school with a week on the job) in the areas of industry, retail stores, and offices. He reported that 91% of the students receiving cooperative training in high school were placed and that promotions and higher pay followed quickly in most cases.¹⁸

The literature of the early thirties provided several examples of successful cooperative plans within the high schools. Articles by Weaver,¹⁹ Burmahln,²⁰ Brockman,²¹ Small,²² and Rowse²³ each described successful cooperative

¹⁸E. L. Osgood, "Part-time Cooperative Education in New York," School Review (September, 1932), pp. 493-494.

¹⁹G. G. Weaver, "Some Problems of Cooperative Education," Industrial Education Magazine, XXXII (May, 1931), 352-355.

²⁰E. F. Burmahln, "Students Manage Department Store," The Journal of Business Education, IX (April, 1934), 19-20.

²¹L. O. Brockman, "A Work Try-Out Scheme for High School Students," Monthly Labor Review, XL (April, 1935), 954-955.

²²Robert Small, "Cooperative Schools and Continuation Schools," Industrial Education Magazine, XXXVII (September, 1935), 194-195.

²³Edward J. Rowse, "Securing the Cooperation of

work experience programs in retailing within their particular locale and fitting their particular situations.

It was not, though, until the enactment of the George-Deen Act (1936) that direction in the cooperative method of instruction in distributive education started to develop. This federal legislation provided the basis for what was to become the shape and format of distributive education for the next twenty-seven years. An annual appropriation of \$1,250,000 was authorized on a matching basis to states and territories for salaries and necessary travel expenses of teachers, supervisors, and directors, and for teacher training in distributive occupational subjects.²⁴

Refinement Period in the Development of the Cooperative Method

If one were to characterize the period of growth in the cooperative method from 1936 to 1963, the word "refinement" would adequately describe the situation. The journals of this period are replete with articles which deal with the sophistication of the cooperative plan through the refinement and adaptation of the cooperative method. The period between 1936 and 1963 may be further analyzed to show the evolution of the cooperative method in distributive education. The period from 1936 to the end of World War II was one of expounding the virtues of the cooperative method and learning

Merchants in Training Salespeople in Secondary Schools," The National Business Education Quarterly, IV (December, 1935), 18-20+.

²⁴U. S., Statutes at Large, XLIX, Part 1, 1488.

how to establish a cooperative program, including illustrations of how the cooperative method had effectively provided industry with competent workers.

During this time, Horace B. English, a psychologist, treated the cooperative method from a psychological standpoint, stating that young people are restless and need and want to work because of their biological and psychological make-up. He believed the difficulties of the Depression had a deep bearing on the development of the cooperative method.²⁵

Keller also emphasized the need for an occupational experience as a help to methodology and motivation. He suggested several areas for work experience for both boys and girls in light of his belief that people experience a need to work.²⁶ Another writer who stressed the importance of the cooperative experience to youth of the times who were troubled by problems of employment and assimilation into the working world was Douglas.^{27, 28}

Typifying the "how to start a cooperative program" series was an article by Banks of the A. S. Beck Shoe

²⁵Horace B. English, "Education Through Work in a Time of Social Change," Educational Method (November, 1935), pp. 67-71.

²⁶F. J. Keller, "Earning and Learning in 1937," Journal of Adult Education, IX (April, 1937), 141-145.

²⁷Harl R. Douglas, "Youth, School, Work, and Community," School and Society (July 15, 1939), pp. 65-71.

²⁸Harl R. Douglas, "Youth Needs Work Experience," Business Education World, XX (May, 1940), 784-785.

Corporation. In his article he gave his own "recipe" for organizing a cooperative program, emphasizing the role of the coordinator in making job placements and the need for standards and requirements for both student and store selection.²⁹

Schindel's view typified that of industry regarding the cooperative method. The author believed that business and education had a number of areas of common concern-- student character, intelligence, intuition, and adaptability. He viewed the cooperative experience as a method that would mutually enhance both business and the schools in turning out an especially trained individual as well as a better generally educated person.³⁰

After World War II the refinement process in the cooperative method became even more intense. At this time the refining involved the classroom aspect of the method. Previously, vocational educators were more concerned with improving and defining the cooperative method as it involved cooperation with businesses in the community. Articles in journals during this period emphasized the virtues of the cooperative method in terms of what it could

²⁹M. Banks, "Establishing Store Relationships for a Cooperative Program of Distributive Education," Industrial Art Education, XXXII (November, 1943), 370-372.

³⁰Philip W. Schindel, "The Role of Business in Cooperating With the School," Community Cooperation in Business Education, American Business Education Yearbook, I (Somerville, N. J.: Somerset Press, 1944), 181-187.

do for the child in the classroom to improve learning. Horn's chapter in the 1953 Business Education Yearbook, for example, stressed the fact that the cooperative method allowed for students' individual differences and enabled teachers to design individual curricula to suit each child's needs and interests.³¹ In the same Yearbook, Cooper's chapter made the point that the cooperative method, having reached its full maturity in this era of evaluation, could be easily evaluated by asking the following questions:

Did the cooperative experience bring the student closer to everyday living?

Did the experience create interest in the business world?

Did the experience provide up-to-date information not available in textbook form?

Did the experience enrich the classroom discussion?

Did the cooperative program supply resource material for the student?

Did the experience develop desirable attitudes?

Can the graduates get and hold the jobs they were prepared for?³²

Another commonly used means of evaluating and ultimately bringing about the refinement of the cooperative method was explained by Severson. The process he discussed

³¹D. C. Horn, "Criteria For Individual Instruction," American Business Education Yearbook, X (Somerville, N. J.: Somerset Press, 1953), 340-345.

³²Walter A. Cooper, "Evaluating Effective Learning Through School-Business Cooperation," ibid., 420-435.

was the survey questionnaire sent to distributive education coordinators, in this particular instance to sixty-one teachers, to ascertain problem areas and suggestions for alleviating certain common problems in operating a cooperative program. In 1956 Severson's survey revealed that the most common problems experienced by the distributive education teacher-coordinators were maintaining student interest in related classwork, loss of interest in jobs, and practical application of the subject matter.³³

More Recent Developments in the Cooperative Method

In 1962 the cooperative method in distributive education shifted into another stage of development. Hartzler identified this stage as one in which distributive education could be characterized as a "body of knowledge to be taught."³⁴ He stated that prior to this time distributive education was treated as a method of teaching synonomous with the cooperative method. Now in this period of development distributive education had come into its own as a distinct body of knowledge, whereas the cooperative method was considered distinct from distributive education per se but characteristic of vocational education in general. Hartzler also predicted

³³L. C. Severson, "How Teacher-Coordiators Rate Their Problems," UBEA Forum, II (December, 1956), 26-28.

³⁴F. E. Hartzler, "The Three Stages of Distributive Education," Journal of Business Education, XXXIX (April, 1964), 289-290.

that within the body of knowledge of distributive education would come a decrease in emphasis upon the cooperative method and occupational experience.³⁵

With the passage of the Vocational Education Act of 1963 came a reappraisal of the cooperative method in distributive education. As such, distributive education and the cooperative method were no longer synonymous, and several leaders in the field feared that the total distributive education program might suffer from this development. However, in its new and more comprehensive role, distributive education, which had been successful in the past with the cooperative method, would now be able to expand its program. This, according to Warren Meyer, was the most significant consideration, for the needs and interests of the children involved are of more importance than dedication to a particular method of instruction. What should develop from this sequence of happenings is a larger expansion and a more comprehensive field, encompassing the cooperative method and other methods which help achieve the goals of the total program.³⁶ Perhaps Nelson in his recent article has best characterized the most exact thinking on the cooperative method as it relates to distributive education.

³⁵Ibid., 290.

³⁶Warren G. Meyer, "A New Era in Distributive Occupations," Business Education Forum, XVIII (April, 1964), 6.

The distinction between method and discipline is important to any assessment of concepts relating to curriculum identification and organization. Much progress has been made in projecting a discipline of distribution that was made vocational through the specialized methodology of cooperative training. It must be recognized at the outset that the discipline of distribution or any segment thereof can be and is taught for general education purposes. To teach for vocational purposes, certain participation activities must be evident in each distributive education curriculum which directs and measures the achievement of employment qualifications.

The Vocational Education Act of 1963 outlines exciting new challenges for distributive education. Now an opportunity has been given to prove that the achievement of employment qualifications for distributive occupations can be developed through a method other than through continuing employment experiences. Keeping in mind the earlier concept that the cooperative plan of instruction in effect prepared students for subsequent employment responsibilities, preparatory instruction under the new legislation can now be defined as pre-employment instruction in distribution and marketing utilizing either the cooperative plan or the new project plan of training.³⁷

The historical development of the cooperative method as it relates to the educative process and in more recent years to distributive education has had root in a practical philosophical and psychological base. No matter what its emphasis at any one point of time within its development, one primary tenet has been evident--the cooperative method has contributed much to making education more meaningful to the learner.

The Project Method of Instruction

The project method of instruction has been and is being used on all levels of teaching--elementary through the

³⁷Edwin L. Nelson, "A Conceptual Framework for Curriculum Development in Distributive Education," Business Education Forum, XX (April, 1966), 10.

university. The method is not a new one but the results of the ideas, thinking, and practices of many educators who strove to provide for realism in the teaching-learning situation.

Early Use of Projects in Vocational Education

One of the earliest mentions in vocational education of the term "project" appeared in publications of the United States Department of Agriculture.

When Franklin Ernest Heald, as specialist in Agriculture Education (1914-1918), first organized vocational agriculture education; he described the use of projects as a teaching method particularly suited to vocational agriculture training.³⁸ Previous to this, a bulletin of the U. S. Department of Agriculture by W. M. Hays (1896) on several methods of instruction in teaching vocational agriculture included both individual and group projects, referred to as "laboratory work" by Hays.³⁹ When these agriculture educators referred to projects, they had in mind such practical, out-of-school activities as the students' growing their own corn, raising livestock, or participating in group activities such as managing a slaughterhouse or building a barn.⁴⁰

³⁸Bayles and Hood, p. 236.

³⁹W. M. Hays, Methods of Instruction in Teaching Agriculture, United States Department of Agriculture, Office of Experiment Stations Bulletin No. 30 (Washington: Government Printing Office, 1896), pp. 37-39.

⁴⁰Ibid.

At this time the Department of Agriculture accepted the term "project" to mean "an outlined plan for carrying on a piece of cooperative work."⁴¹ Other vocational educators (Stimson, Snedden, Prosser, Allen, and others) in Massachusetts' vocational schools also developed "projects" and "home projects" during this same period.⁴² It is apparent, then, that much of what was project work in agriculture education in the early part of the century was similar in theory and practice to what later developed as the cooperative method of instruction in other areas of vocational education. Each supplemented classroom instruction with practical activities both in and out of the classroom.

Projects and the project method of instruction received widespread attention and acceptance not only in agriculture education but also in other areas of vocational education, such as home economics and trade and industrial education. The projects recommended by leaders in the fields and designed by individual classroom teachers fit well into the vocational curriculum for their ends-in-view were the practical outcome of the student's experience with and knowledge of the activity. As such, the project method as a supplement to classroom instruction furthered the practical nature of the vocational curriculum.

⁴¹John A. Stevenson, The Project Method of Teaching (New York: Macmillan Co., 1921), p. 40.

⁴²Ibid., p. 41.

The Development of the Project Method
in General Education

Whether and how "projects" as known by these vocational educators came into general education as the "project method" can be the subject of intense academic debate. William Heard Kilpatrick of Teachers College, Columbia University, is generally credited with early recognition of the merits of the method and its applicability to the philosophy of the Progressive movement in education. In general terms, Progressive Education developed in answer to early twentieth-century rejection of teacher-dominated schools. In line with the thinking of Rousseau, Froebel, Dewey, Kilpatrick, and others, Progressive Educationists believed quite sincerely in the idea that children's own interests should play a greater part in the selection and treatment of subject matter.⁴³ It is not the purpose of this review to either defend or condemn--or expound--the Progressive movement. It is only necessary to be aware of the reasoning behind the movement that adopted and adapted the use of projects into a method of instruction somewhat different from its previous function. And, it was Kilpatrick and his followers who have been also generally recognized as the founders of the project method of instruction.⁴⁴

In a recent article (February 1966) in the Teachers College Record, a colleague of Kilpatrick, George Douglas Hofe,

⁴³Bayles and Hood, p. 221.

⁴⁴Ibid., p. 228.

shed some light on the relationship at Teachers College of Kilpatrick, J. F. Woodhull, and the project method. The project method, said Hofe, ". . . was the name given to a method of teaching conceived earlier in the century."⁴⁵ According to Hofe, it was J. F. Woodhull who not only conceived the method but also gave it its name, as he proposed the project method for the teaching of science. Both Hofe and Woodhull even then (around 1916-1918) admitted "there is nothing new or unusual in the development of a project. . . ." and the method was "the result of a long train of thought."⁴⁶ However, Hofe contended that the project method had never been utilized or put into practice until Woodhull--before Kilpatrick. Hofe described a conversation he had with Kilpatrick in 1917 about Woodhull's project method; Hofe also gave Kilpatrick several science and mathematics journals which contained some of Woodhull's and Hofe's articles and speeches about the project method.⁴⁷ This was well before any publications or public statements by Kilpatrick on the project method. Apparently, several of the faculty at Teachers College were actively involved in the development of the project method in general education during this period,

⁴⁵George D. Hofe, "The Project Method and Its Origin," Teachers College Record, LXVII (February, 1966), 371.

⁴⁶Ibid., 372.

⁴⁷Ibid.

the same time, it may be noted, during which the Department of Agriculture devoted attention to the development of projects.

The direction many of these educators at Teachers College took in their thinking can be summarized by the following paragraphs from Tenenbaum's biography of Kilpatrick.

Agreeing with Dewey that life was a social process; that the very personality of the human being was socially built; that there existed no conflict between social institutions and individual needs; that institutions were made to serve man and that they were necessary for man, Kilpatrick sought to isolate a unit of behavior that would be educative in nature, a unit of behavior that offered the maximum possibilities of growth for the whole person, his ethical, moral, intellectual, and social self; a unit of behavior that would fit the needs of an individual living in a changing, dynamic, democratic society; a unit of behavior that would in itself be a prototype of a life good to live and would lead a person to grow into an ever-better life; a unit of behavior that would permit him to interact with his environment and with society, so that he might link his self with a promise of intertwined personal and social growth.

In 1915 he arrived at such a unit of behavior; and this he published in 1918 in the Teachers College Record under the title "The Project Method: The Use of the Purposeful Act in the Educative Process."⁴⁸

In this article, reprinted later as a pamphlet which had a tremendous impact upon education (over 60,000 copies sold),⁴⁹ Kilpatrick said he found this "unit of behavior"

⁴⁸Samuel Tenenbaum, William Heard Kilpatrick: Trail Blazer in Education (New York: Harper & Brothers, 1951), p. 140.

⁴⁹Ibid., p. 88.

to be "in the conception of wholehearted purposeful activity proceeding in a social environment."⁵⁰ To this "hearty purposeful act" Kilpatrick gave the name the "project method," also giving to the terms project and project method a unique and original interpretation.⁵¹ Believing that children are naturally both active and social, Kilpatrick contended that "wholehearted purposeful activity in a social situation as the typical unit of school procedure is the best guarantee of the utilization of the child's native capacities."⁵² He defined "purposeful act" as an activity having a purpose for and by the child, an activity "purposed" by the child himself, or by a group of children. "The worthy life," said Kilpatrick, "consists of purposive activity and not mere drifting."⁵³ Since society rewards the man of action, then children must be acclimated to the idea of purpose to their activities. If education be considered as life itself, then, Kilpatrick contended, "it follows that to base education on purposeful acts is exactly to identify the process of education with worthy living itself."⁵⁴ The purposeful act then became,

⁵⁰William H. Kilpatrick, The Project Method: The Use of the Purposeful Act in the Educative Process, Teachers College Bulletin No. 1918 (New York: Teachers College, Columbia University, 1918), p. 4.

⁵¹Tenenbaum, p. 140.

⁵²Kilpatrick, p. 18.

⁵³Ibid., p. 6.

⁵⁴Ibid.

in Kilpatrick's theory, the "typical unit of instruction"--hence the project method and entire curricula built around teaching by the project method.

At the height, then, of the growth and development of Progressive Education, Kilpatrick developed his project method, which was based on his formula, "pupil purposing, pupil planning, pupil executing, pupil judging."⁵⁵ The point of Kilpatrick's interpretation of a project was that it was to be pupil chosen. He rejected the theory of teacher-dominated classrooms by stating that the project method was not to be used "to put over prior-chosen subject matter."⁵⁶ Pupil interests--choices--then were to determine curriculum. It seemed easy to recognize here the "blatant" permissiveness attributed to Progressive Educationists, such as Kilpatrick, Dewey, Collings, McMurtry, et al. Criticism of the Progressive Education movement, and the project method, was directed at the permissive nature of this theory when put into practice by educators who did not fully understand and thereby misinterpreted the philosophy and psychology underlying the Progressivists' thinking. All too often educators adopt an "either/or" attitude. Such was the case here, when educators swung from "teacher-dominated" to "child-centered" schools.⁵⁷ Kilpatrick and his colleagues

⁵⁵Bayles and Hood, p. 227.

⁵⁶Ibid., p. 228.

⁵⁷Ibid., p. 230.

did not intend to do away with the teacher in the classroom. Through the project method, Kilpatrick hoped to see the development of

. . . children so engrossed in their tasks, so able to manage the techniques and skills necessary for their tasks, that they became increasingly independent of external direction. This was the aim, to be sure, to strive for, but the teacher must be there to guide as needed.⁵⁸

Consequently, when put into practice, Kilpatrick's theory did not in reality work, unless the teacher took an active role in the four aspects of the project method, purposing, planning, executing, judging--a role Kilpatrick seemed to say should not exist.

In the decades following World War I, the project method gained widespread attention and acceptance in a variety of implementations in general education. Many advocates of the project method adopted Kilpatrick's viewpoint and developed or attempted to develop entire curricula based on teaching by the project method. Margaret Wells attempted to organize the curriculum of the elementary school by designing a project for each grade level.⁵⁹ As more teachers became involved in the use of the project method, some negative reactions were recorded. Teachers soon discovered that they needed training to teach by the project method;⁶⁰

⁵⁸Tenenbaum, p. 177.

⁵⁹Margaret E. Wells, A Project Curriculum (New York: J. B. Lippincott Co., 1921).

⁶⁰W. E. Blaine, "The Present Status and Future Possibilities of the Project Method in Public School Teaching," Educational Method, IX (Nov.-Dec., 1929), 94-104.

that the method was not a "magic potion," but merely an additional and effective teaching technique.^{61, 62, 63, 64}

Evidence of teacher frustration and inadequacy in adopting Kilpatrick's version of the project method was found, in 1939, by Tenenbaum. He discovered that teachers and administrators were incorrectly implementing the project method; over 90% of the projects Tenenbaum saw were teacher-conceived and all too many were also teacher-executed.⁶⁵

The professional journals are replete with articles written by teachers in which they explained and described effective uses of the project method in their classes--in geography,⁶⁶ in industrial arts,⁶⁷ in speech,⁶⁸ in a combined

⁶¹W. O. Stark, "Problem of Discipline in the Project Method of Learning," Education, XLI (January, 1921), 310-311.

⁶²H. B. Alberty, A Study of the Project Method in Education (Columbus: Ohio University Press, 1927).

⁶³R. C. Perry, "Project Method: Some Advantages and Disadvantages," High School Teacher, VI (February, 1930), 59-60.

⁶⁴T. L. Lancaster, "Project Teaching," Education, LI (January, 1931), 310-313.

⁶⁵Samuel Tenenbaum, "Project Method: A Criticism of Its Operation in the School System," School and Society, XLIX (June, 1939), 770-772.

⁶⁶Eleanor Rayne, "Four Years of Experimentation With the Project Method" (unpublished Master's dissertation, Tulane University, 1927).

⁶⁷C. B. Hillard, "Individual Projects Made On the Group Method Plan," Industrial Arts Magazine (August, 1923), pp. 305-306.

⁶⁸Lucille March, "The Project Method in Speech Education," Quarterly Journal of Speech, XV (April, 1926), 181-188.

English-social studies class.⁶⁹ In all of these, the project method was used as an additional teaching technique. No mention was made of designing a curriculum based solely on the project method.

Early Development of the Project Method
in Distributive Education

Specifically in distributive education, teaching by projects also gained widespread attention. In 1950 Reno Knouse discussed the need to vary methods in teaching salesmanship on the secondary level. He made the statement,

I should like to recommend the student-project method of teaching as insurance against loss of student interest and retardation of the learning process. I believe that this method will do more to pep up a class than any other technique, if properly alternated with other teaching methods.⁷⁰

There are many examples in the journals of projects which have built and maintained interest and "pepped up" distributive education classes. The most obvious and comprehensive project is, of course, the school store.^{71,72,73}

⁶⁹A. C. Armstrong, "Project Teaching Develops Language Arts," English Journal, XLI (December, 1952), 544-547.

⁷⁰R. S. Knouse, "How to Teach Salesmanship," UBEA Forum, IV (April, 1950), 19-21.

⁷¹Gilbert Peart, "Business Experience Through School Stores," Journal of Business Education, XVI (April, 1941), 22-24.

⁷²L. P. Balletto, "Outside Activities in Business Education Pay Off," School Activities, XXXI (April, 1960), 231-234.

⁷³E. T. Ferguson, Jr., "Coordinators, Start That School Store Today," The Balance Sheet, XLV (September, 1963), 20-21.

Merchandise manuals were also mentioned as an effective project.⁷⁴ One distributive education teacher also described the merits of a project in which distributive education students handle the merchandising of their school's publications.⁷⁵

Additional effective uses of teaching by projects which many journal articles discussed were those concerned with projects which furthered better public relations as well as served the needs of the students involved. Most common among these were the projects in which the distributive education students assumed the complete responsibility of managing a local store.^{76,77,78,79,80} Distributive education students also participated in window display projects in

⁷⁴Donald K. Beckley, "Merchandise Manuals Vitalize Retailing Courses," Journal of Business Education, XVII (February, 1942), 17-18.

⁷⁵H. D. Smith, "Merchandising and the School Publications," Business Education World, XXV (February, 1950), 284-285.

⁷⁶George F. Dean, "A Vocational School Day," Business Education World, XX (June, 1940), 872-875.

⁷⁷A. E. Forsman, "Christmas Selling," Clearing House, XV (September, 1940), 44-46.

⁷⁸Forsman, "High School Day in Dubuque Retail Stores," Journal of Business Education, XVI (December, 1940), 19-20.

⁷⁹Gloria Clements, "Store For a Week," Business Education World, XXXIII (June, 1953), 507-508.

⁸⁰Peter G. Haines and E. T. Ferguson, Jr., "Distributive Education," Business Education World, XLVII (January, 1967), 34.

cooperation with local stores,^{81, 82} in fashion shows,^{83, 84} and in shopping surveys done in cooperation with the business community.^{85, 86}

The survey of the literature of the period from the 1920's to the early 1960's thus revealed the status of the project method to be somewhat similar to that of the period before the Progressive Education movement. In practice, the project method as interpreted and developed by Kilpatrick was found to be impractical, for teachers discovered that no one method could serve all purposes in the classroom. The project method existed then as an effective and supplemental teaching method, both in and out of the classroom in both general and vocational education.

Recent Developments of the Project Method in Distributive Education

In 1963 the project method again came into the forefront in vocational education, this time primarily in

⁸¹Joseph C. Hecht, "Retail Display Window Training," American Vocational Journal, XXV (December, 1950), 21-22.

⁸²H. H. Gram, "Use Your DE Club to Build Good Public Relations," The Balance Sheet, XLII (October, 1960), 61.

⁸³R. F. Heiss, "Cooperative Fashion Show: Retailing Project," Business Education World, XXIX (June, 1929), 592-595.

⁸⁴C. H. Henry, "Some Techniques for Staging the Retail Fashion Show," Business Education World, XXX (October, 1949), 77.

⁸⁵W. B. Weale, "Business and School Cooperation," Journal of Business Education, XXII (May, 1947), 17-18.

⁸⁶R. S. Knouse, "Students Service Shoppers," Business Education World, XXVIII (October, 1947), 108-109.

distributive education. (It is interesting to note here that as far back as 1939 A. L. Demond made this statement in referring to distributive education:

. . . Having passed the experimental stage, it has been definitely realized that such courses cannot be taught in the traditional way of most commercial or vocational courses.

He suggested that projects be used to complement cooperative training and "to provide a substitute for it where it has been found impractical."⁸⁷ And in 1961, G. E. Dittamo suggested the use of projects to establish distributive education programs when the cooperative method was not feasible.⁸⁸ The President's Panel of Consultants on Vocational Education suggested in their 1963 report that vocational education programs be made available to more students in secondary schools.⁸⁹ The Vocational Education Act of 1963 provided for distributive education a means to expand and enlarge programs through the establishment of pre-employment in-school preparatory training programs in distributive education.⁹⁰ This provision made possible the introduction of the project method into the field of distributive education. Members of

⁸⁷A. L. Demond, "Practical Projects for Courses in Distributive Education," National Business Education Quarterly, VII (May, 1939), 30-34.

⁸⁸G. E. Dittamo, "A Practical Beginning for a Program in DE," Business Education Forum, XVI (December, 1961), 26.

⁸⁹U. S. Department of Health, Education, and Welfare, Office of Education, Education for a Changing World of Work, p. 226.

⁹⁰U. S. Congress, Senate Committee on Labor and Public Welfare, Selected Education Acts of 1963, p. 97.

the Distributive Branch of the USOE recognized the project method as a natural, realistic method of instruction which readily enabled the education of more students in a pre-employment situation.

In October 1963, Mary V. Marks, Program Specialist in Distributive Education of the USOE, told the National Clinic on Distributive Education that "participation activities will be used to re-enforce learning."⁹¹ Miss Marks then went on to include both "cooperative training" and "project training" as types of participation activities. She said,

In addition to cooperative training, participation activities as we have described them also include group or individual projects which may be used by the instructor to encourage vocationally-centered learning. . . . From the outset students should find in the project plan opportunities for working as members of a team as well as opportunities for self-directed achievement.⁹²

In April 1965, John A. Beaumont, director of the Occupational Branch in the division of Vocational and Technical Education of the USOE, wrote:

The project plan, which now may be offered, is based upon individualized learning activities, which would be enhanced by supervised work experience. . . . When a cooperative plan proves impractical for one reason or another, the project training approach may serve as the total sequence of training. . . .

Provision for the development of preparatory programs utilizing participation activities may be

⁹⁰U. S. Congress, Senate Committee on Labor and Public Welfare, Selected Education Acts of 1963, p. 97.

⁹¹Mary V. Marks, "The Vocational Approach in Education for Distribution," p. 4.

⁹²Ibid., pp. 4-5.

expected to open the doors to a career in distribution for many youth who might not normally be selected for cooperative programs.⁹³

Then, in December 1965 at the AVA Convention, Mary V. Marks, in a speech in which she described the project method and its applicability to distributive education, formally designated "the project method and the cooperative method as the two broad categories of participation activities used by distributive educators to prepare students for employment in distribution and marketing."⁹⁴

The project method was then officially endorsed as equal to the cooperative method as a means of providing education to students in the field of distribution and marketing. As adapted by distributive educators, the project method "centers around individually designed learning activities which are coordinated with classroom instruction and related to a student's occupational objective."⁹⁵ Projects, then, are teacher-purposed, with the teacher taking an active role in all aspects of the projects, in contrast to Kilpatrick's interpretation which placed greater emphasis on the interest of the child.

Hence this new adaptation of the project method has such learning objectives as:

⁹³John A. Beaumont, "Distributive Education and the Vocational Education Act of 1963," Business Education Forum, XIX (April, 1965), 6.

⁹⁴Mary V. Marks, "The Project Method in Action," p. 7.

⁹⁵Kay B. Brown, Distributive Education in the High School (Richmond: Richmond Professional Institute, 1965), p. 49.

. . . to refine and strengthen competencies needed for success in the field of occupational choice
 . . . to demonstrate ability to use the discipline of distribution effectively on behalf of people, products or services, and profits
 . . . to evaluate the maturation process of a distributive worker-in-training
 . . . to appraise subjectively trends, requirements, and opportunities for career growth in distribution and marketing.⁹⁶

In May 1967 the USOE sponsored two one-week national seminars in distributive teacher education at Michigan State University and Arizona State University. The purpose of the seminars was to bring the distributive teacher educators up-to-date on the latest ideas and developments relating to the project method of instruction in distributive education.

In essence, this historical survey of the cooperative and project methods of instruction in distributive education revealed that both teaching methods have well-grounded philosophical and psychological bases. Much of the literature included was "opinion" literature which presented ideas for implementation and adaptation and ideas about the advantages and/or disadvantages of the teaching method. What is needed at this point in time are empirical studies of the effectiveness of the project method as a means of reaching the established learning objectives of distribution and marketing.

⁹⁶Mary V. Marks, "The Visibility of Vocational Integrity in Distributive Education," Business Education Forum, XX (May, 1966), 15.

CHAPTER III

PROCEDURES IN THE STUDY

This chapter describes the procedures used in the study, presented in four sections: (1) the nature of the experimental instruction, (2) the data collected, (3) processing of the data, and (4) the procedures employed in analysis of the data.

The Nature of the Experimental Instruction

In January 1966 a meeting was called¹ at Michigan State University for the purpose of informing vocational directors, principals, and other interested administrative personnel that the Research and Development Program in Vocational-Technical Education at Michigan State University was interested in entering into a joint research venture in the area of distributive education with the public schools of Michigan. During the meeting, the curriculum development project and the research proposal outlined in Chapter I of this report were explained to the school officials. The administrators completed information sheets² if they believed sufficient

¹See Appendix A.1 for a copy of the letter of invitation.

²See Appendix A.2 for a copy of the information sheet.

interest in participating would be generated in their school districts. Fifty-three school districts expressed interest. Later, a form letter was sent to all secondary school superintendents in the State of Michigan, informing them of the research to be conducted during the coming year. Twenty-eight more inquiry sheets were submitted in response to this mailing.³

From January 1966 to June 1966 visits were made to the schools interested in participating in the curriculum development project and the proposed research study. Twenty schools were initially chosen to participate. Final selection of these schools was made on the basis of administrative support, teacher willingness, size and location of school, and the availability of distributive education laboratory equipment. Because of local administrative and personnel problems, during the summer of 1966 three of the twenty schools withdrew from participation. Contracts were signed between the seventeen participating schools and the Research and Development Program in Vocational-Technical Education.⁴ On August 15, 1966, these seventeen schools started the initial phase of the Research and Development curriculum development project.

³See Appendix A.3 for a copy of the form letter.

⁴See Appendix A.4 for the details of the contract.

Schools

Ten of the seventeen schools were included in this study. Selection of these ten schools was based upon the fact that in each of the ten schools, the same teacher taught both the preparatory project method class and the cooperative method class. It was believed that the teacher variable could be more readily controlled by limiting the study to these ten schools. Each school contained a reimbursed⁵ eleventh-grade preparatory distributive education class and a reimbursed twelfth-grade cooperative distributive education class. The schools represented communities of various sizes, distributed throughout the state in proportion to concentration of population (see Table 1).

Table 1. Characteristics of the Ten Michigan Public High Schools in the Study

Name of High School	Location	Enrollment ^a (grades 10-12)	Type of Community
Benton Harbor	Benton Harbor	2390	City
Grosse Pointe	Grosse Pointe	1399	Suburb
Highland Park	Highland Park	1380	City
Lincoln Park	Lincoln Park	3109	Suburb
Monroe	Monroe	1750	Small City
Petoskey	Petoskey	438	Town
Lake Shore	St. Clair Shores	1296	Suburb
Utica	Utica	2310	Suburb
Fitzgerald	Warren	1003	Suburb
Warren Woods	Warren	850	Suburb

^aAs of fourth Friday, September 1966.

⁵The term "reimbursed" is used to denote an instructional program which conforms to the requirements set forth in the Michigan State Plan for Vocational Education.

Teachers

All the participating teachers had had in their undergraduate or graduate teacher preparation programs a minimum of one course in the methods of teaching cooperative distributive education. Table 2 presents information obtained from each of the ten teachers about their professional preparation and teaching experience and includes additional data regarding age and sex.

Since the project method of instruction is new to distributive education, each teacher attended a two-week summer workshop on "Teaching by the Project Method of Instruction in Distributive Education." In addition, four one-day workshops were provided for the participating teachers in October, December, April, and May. During these workshops the project teaching methods and materials were reinforced, evaluated, and revised. To observe the classes and provide any needed assistance, the researcher and his staff made a total of four visits to each of the schools during the period from September to May.

Students

The students involved in the study were enrolled in one of four different courses at each of the ten schools. Group one consisted of the eleventh-grade students enrolled in the project method distributive education class; group two, a control group of eleventh-grade English or social science students; group three, the twelfth-grade students enrolled in

Table 2. Characteristics of the Ten Distributive Education Teachers

Teacher ^a	Sex	Age Range	Degree	Quarter Hours Beyond Degree	Number of Years Teaching Experience	Number of Years in Present Position
1	M	25-29	MA	3	1	1
2	F	30-34	MA	46	3	3
3	M	30-34	MA	18	6	3
4	M	30-34	BA	15	6	6
5	M	25-29	BA	15	2	2
6	F	25-29	BA	17	4	1
7	M	25-29	BA	16	2	2
8	M	40-44	MA	28	7	-1 ^b
9	F	25-29	BA	15	4	4
10	M	20-24	BA	27	-1	-1

^aListed by school code number.

^bDenotes less than one year.

the cooperative distributive education class; group four, a control group of twelfth-grade English or social science students. The final sample comprised only those students who were present for all testing. The only criteria used in selecting the students were that they be eleventh graders if enrolled in the preparatory class, eleventh graders and not distributive education students if enrolled in the eleventh-grade control class, twelfth graders if enrolled in the cooperative class, and twelfth graders and not distributive education students if enrolled in the twelfth-grade control class. The students in the control classes were not grouped by ability. In the selection procedure, students' prior experiences relating to distributive education were not taken into consideration.

This selection procedure produced a final sample of 169 subjects in the eleventh-grade project method group, 186 in the eleventh-grade control group, 188 in the twelfth-grade cooperative method group, and 190 in the twelfth-grade control group, making a total population of 733 students. Table 3 delineates the student sample by school, class group, and sex.

Type of Instruction

Each of the eleventh-grade distributive education project method classes was a single period in length (usually fifty minutes) and met five days a week. The curriculum for the eleventh-grade project method class was developed at Michigan State University. Each teacher was provided with curriculum guides and units of study which included content material integrated with projects designed for individual students as well as groups of students. The units of instruction included in the period from September 1966 to January 1967 were entitled "Employment Orientation," "Self Improvement: Vocational, Educational, and Personal," and "The Sales Process." Basic economic concepts are included in all these units.

The twelfth-grade distributive education cooperative method classes were also a single period in length, five days a week, with students employed in distributive occupations on the average of fifteen hours a week. The cooperative classes were taught in the traditional manner, relating

Table 3. Student Population of the Study

School Code Number	Group 1 (11th-grade Project)			Group 2 (11th-grade Control)			Group 3 (12th-grade Coopera- tive)			Group 4 (12th-grade Control)			Total for Each School
	Girls	Boys	Total	Girls	Boys	Total	Girls	Boys	Total	Girls	Boys	Total	
1	10	5	15	7	11	18	8	14	22	4	10	14	69
2	10	6	16	6	12	18	7	5	12	9	11	20	66
3	20	11	31	6	12	18	17	12	29	4	12	16	94
4	8	11	19	11	7	18	10	7	17	13	5	18	72
5	9	6	15	4	6	10	14	5	19	6	12	18	62
6	10	3	13	18	11	29	4	12	16	14	13	27	85
7	12	4	16	5	10	15	14	11	25	6	11	17	73
8	5	4	9	11	4	15	4	10	14	16	11	27	65
9	17	4	21	16	6	22	3	3	6	7	4	11	60
10	9	5	14	15	8	23	20	8	28	15	7	22	87
Totals:	110	59	169	99	87	186	101	87	188	94	96	190	733 Grand Total

classroom instruction to the students' occupational experiences.

The control classes were either English or social science classes, not grouped by ability, comprised of non-distributive education students, and were used for comparison purposes only.

Nature of the Data Collected

Several types of data were collected concerning the schools, students, and teachers: (1) information regarding the socio-economic status of the school community and of the parents of the students included in the study; (2) estimates of each student's prior achievement based on results of a standardized test in reading; (3) scores for each student on certain standardized tests of economic understanding, sales comprehension, and sales terms; (4) personal data sheets on each student and distributive education teachers; and (5) scores on a teacher attitude inventory for each distributive education teacher.

The factors of age, sex, socio-economic status, prior student achievement, and teacher attitude were identified as independent variables which might contribute to the results of the standardized tests and thus to the apparent effects of the treatment. Not knowing to what extent these factors would bias the results of the treatment, it was assumed that these factors could make all, or one hundred

per cent, of the difference in student achievement on the standardized tests measuring sales comprehension and economic understanding. Thus, only when these factors were successfully controlled or adjusted for could any difference in scores be attributed to the treatment.

Socio-economic Status

The process used to measure the socio-economic status of the school communities was an interview with the principal or superintendent of each school, using an interview sheet and an index previously developed for this purpose and used in a prior Michigan State University educational research study.⁶ Developed by Paul Messier, assistant director of that study, the instrument was designed to estimate the socio-economic status of the students involved in the study. Items used in the instrument were derived from the "Index of Status Characteristics" developed by W. L. Warner, et al.⁷ Messier's instrument includes the same general social, economic, educational, and ethnic categories as Warner's index. Some of the descriptive statements were modified by Messier for the sake of

⁶Karl T. Hereford et al., Relationships Among School Design, Utilization, Personnel Interaction, and Attitudes ("Educational Research Series," No. 7, East Lansing, Michigan: Bureau of Educational Research, College of Education, Michigan State University, 1963), p. A.4.3.

⁷W. L. Warner et al., Social Class in America (Chicago, Ill.: Science Research Associates, 1949), pp. 121-129, 177-185.

simplicity.⁸ After the interviews with the administrators, scores were derived from their responses to the items on the instrument. The scores from the first four categories were grouped and labeled the socio-economic index. The remaining two scores, racial-ethnic intermix and occupational level, were treated separately.

An additional index of socio-economic status was obtained through the use of Duncan's Socio-Economic Index, which provides ratings based on the occupation of the head of household. An index score expressing the income and educational level coefficient, ranging from 00-99, was obtained for each student in the study. This information enabled comparisons to be made with the information derived from the Messier index.⁹

Student Prior Achievement

The Sequential Test of Educational Progress--Reading, Form 2A, was used as a measure of prior achievement.¹⁰ This particular test was chosen as an adequate indicator of prior achievement on the advice of Dr. Robert L. Ebel, Department of Counseling, Personnel Services and Educational

⁸See Appendix B.1 for a sample of the instrument.

⁹Hereford reported the Rho-Rank Difference correlation between the results of the Messier index and the Duncan index to be $r = -.69$. (Hereford et al., pp. A.6.1-A.6.11.)

¹⁰Sequential Tests of Educational Progress (Princeton, N. J.: Cooperative Test Division, Educational Testing Service, 1957).

Psychology, Michigan State University.¹¹ The researcher also considered the following information, as summarized from the Technical Report provided by the test publishers, to be pertinent in determining selection of the test:

Estimates of reliability of the test, using the Kuder-Richardson Formula #20 on 488 eleventh-grade students, showed a mean in raw score units of 43.58 (standard deviation 11.82), with a reliability of .92.

The test is primarily intended as a measure of developed abilities in reading; its content validity is of primary importance. Content validity is best insured by relying on well-qualified persons in constructing a test, as was done for the STEP-Reading.

Sex is a factor on the STEP-Reading. On a sample of boys, 462 eleventh graders and 367 twelfth graders, the means converted to score units were 287.6 and 291.7, respectively. On a sample of girls, 509 eleventh graders and 423 twelfth graders, the mean in converted score units was 291.3 and 295.4.¹²

The STEP-Reading, containing two sections of thirty-five questions each, was administered on two successive days to each student in all of the groups between September 12, 1966, and September 30, 1966. Each section of the test was timed and administered according to the publisher's directions. Machine-scoring answer sheets were used, and scoring was done through the Michigan State University Evaluation Services. Prior to machine-scoring, each score sheet was

¹¹Interview with Dr. Robert L. Ebel, Professor of Counseling and Personnel Services, Michigan State University, April 21, 1966.

¹²"Technical Report," Sequential Tests of Educational Progress (Princeton, N.J.: Cooperative Test Division, Educational Testing Service, 1957).

examined to determine if headings were complete and if directions had been followed.¹³

Test of Economic Understanding

The standardized Test of Economic Understanding, Form A, was administered to all students during the period from September 20, 1966, to October 14, 1966.¹⁴ Form B of the same test was administered during the period from January 9, 1967, to January 20, 1967. Since concepts of economic understanding are woven throughout the units of instruction to which distributive education students are exposed, both the project-method group and the cooperative method group would gain some understanding of economic concepts during the first semester. It would also be expected that both the eleventh- and twelfth-grade control groups would gain, to some degree, additional economic understanding through their course work during that period of time. For this reason pre- and post-tests were given and mean scores and percentile ranks were observed.

The items included in the Test of Economic Understanding were designed to cover those aspects of economics considered by a group of experts, a National Task Force on Economic Education, to be basic economic concepts. Both

¹³These procedures were followed for all the standardized tests administered in the study.

¹⁴Test of Economic Understanding (Chicago, Ill.: Science Research Associates, 1963). (See Appendix C.1 for sample page of test.)

forms of the test contain questions which deal with the three basic economic problems:

1. What shall we produce with our productive resources;
2. How much can we produce in total and how fast should the economy grow;
3. Who shall get the goods and services produced?¹⁵

The test items can be grouped into four main heads: (1) What does the economy produce, and how?; (2) Economic growth and stability; (3) The distribution of income; and (4) Comparison of economic systems.¹⁶

The following are test items representative of each of these four categories, numbered according to category:

1. Three of the following are essential to the operation of a private enterprise economy. Which one might such an economy operate without?
 - A. Profit motive
 - B. Markets
 - C. Corporations
 - D. Prices
2. Of the following, the principle of diminishing returns is best illustrated by
 - A. small firms being driven out of business by large firms
 - B. any decline in the average rate of profits
 - C. a slowing rate of increase in output as a farmer adds increasing amounts of fertilizer to his land
 - D. the decline in personal income as workers age
3. In the United States, the high wages received by most workers depend largely on
 - A. actions of the federal government
 - B. the social responsibility shown by business

¹⁵"Interpretive Manual and Discussion Guide," Test of Economic Understanding (Chicago, Ill.: Science Research Associates, 1963), pp. 28-29.

¹⁶Ibid., pp. 29-31.

- C. our minimum wage laws
 - D. the high output per worker
4. What is meant by the assertion that every economic system (such as socialism, capitalism, communism) faces the fact of scarcity?
- A. There are insufficient productive resources to satisfy all wants of a society.
 - B. There are times when some products can be had only by paying high prices.
 - C. In the beginning every society faces shortages, but a mature economy, such as our own, overcomes scarcity in time.
 - D. All economies have depressions during which scarcities exist.

The researcher believed that the items on the tests were appropriate to measuring economic understanding, one of the five competencies identified for curricular content in distribution and marketing.

The publishers provided additional information which further indicated the appropriateness of these tests:

Estimates of the reliability of the tests, using the Kuder-Richardson Formula #20, were computed for scaled scores, raw scores, differences between Forms A and B, for over 300 high school students of the eleventh- and twelfth-grade levels.

No significant difference in means on test performance was found between male and female students tested.

Measurement showed no significant differences between eleventh- and twelfth-grade students.¹⁷

Test of Sales Aptitude and the Sales Terms Test

It was determined prior to the testing period that none of the control-group students had had a high school course relating to the sales competency; therefore, pre- and

¹⁷Ibid., pp. 34-36.

post-tests were not given. It was decided that results of the one testing would give sufficient indications as to the effect the project method and cooperative method had on greater understanding of the sales competency. The Test of Sales Aptitude (A Test For Measuring Knowledge of Basic Principles of Selling) by Martin M. Bruce¹⁸ and the Sales Terms Test by Joseph E. King¹⁹ were administered to the students in the four groups in January 1967.

Several tests of sales comprehension were examined; the Bruce test was chosen after much consideration. According to the publisher, the ". . . Test of Sales Aptitude is designed to aid in the appraisal of sales aptitude. It provides an objective measure of one important aspect of that aptitude, namely knowledge and understanding of basic principles of selling."²⁰ Additional relevant information provided by the publisher follows:

Norms have been established for both beginning distributive workers and high school students.

Computations for sales and non-sales groups yielded a t of 13.1, suggesting that there is less than one chance in 100 that the means of these groups are not significantly different.

¹⁸Test of Sales Aptitude (New Rochelle, New York: Martin M. Bruce, Ph.D., 1960). (See Appendix C.2 for sample page of test.)

¹⁹Factored Aptitude Series, Sales Terms Test (New York: Industrial Psychology, Inc., 1956). (See Appendix C.3 for sample page of test.)

²⁰"Examiner's Manual," Test of Sales Aptitude (New Rochelle, New York: Martin M. Bruce, Ph.D., 1960), p. 2.

Scores were correlated with final grades of college students studying salesmanship, showing an r of .68, indicating that the test measures comprehension similar to that gained by students studying salesmanship in school.²¹

The following are several sample test items:

1. Which one of the following will best aid a salesman in making a sale?
 - A. demonstrate and otherwise explain the full use of the product
 - B. determine if his potential customers need his product
 - C. offer the product on time payments
 - D. allow the potential customers to use the product on trial
2. In a large city a telephone directory would be most helpful in selecting prospective buyers of which one of the following items?
 - A. electric refrigerators
 - B. automobiles
 - C. magazine subscriptions
 - D. vacuum cleaners
3. "Staple" and "specialty" refer to
 - A. materials sold in the hardware and tool business
 - B. styles of approach in selling
 - C. necessities and luxuries
 - D. an item that has a dual purpose and is therefore a good buy
4. The most important personal characteristic in a successful salesman is
 - A. good speech
 - B. pleasant appearance
 - C. confidence
 - D. determination

The Sales Terms Test was included as a supporting test, for it was designed to test ability to comprehend information of a sales and contact nature that is used in sales or other contact job fields. It was believed that the selling

²¹Ibid., pp. 2-7.

competency could be more accurately assessed by considering also the vocabulary of the field. The test is one of a battery of tests, The Factored Aptitude Series, which measures the eight basic aptitude-intelligence factors: comprehension, systems, perceptual-speed, reasoning, fluency-in-expression, rote memory, space relations, and coordination. All the tests which measure the comprehension factor are terms tests (e.g., office terms, sales terms, factory terms).²²

Sample test items follow:

1. Payment made when goods delivered.
 - A. C.O.D.
 - B. store-door
 - C. charge
 - D. cash sale
2. It was a clearance sale.
 - A. wholesale
 - B. bankruptcy
 - C. budget
 - D. liquidation
3. The price was made retroactive.
 - A. backward
 - B. reduced
 - C. transferred
 - D. subsequent
4. Choice of advertising media is important.
 - A. merchandise
 - B. methods
 - C. promotion
 - D. publications

²²Pre-Validation and Initial Validation Studies of Aptitude-Intelligence Tests in the Job-Test Program, "Factored Aptitude Series" (New York: Industrial Psychology, Inc., 1956), pp. 1-2.

Student Information Sheets

Each student in the four groups completed a data sheet at the time of the first testing in September 1966. Information supplied on the sheets consisted of: name, age, date of birth, sex, school, grade, and father's occupation. Pertinent student information was derived from these data sheets in order to draw comparisons among the four groups.²³

Teacher Information Sheets

Each of the ten distributive education teachers completed a data sheet which drew together pertinent information. No data sheets were obtained from the control group teachers, as it was not considered essential to collect information on these teachers because they did not administer the tests. (Tests were administered by the guidance personnel and/or the distributive education teachers.) The data sheets included the following information: name, age, sex, years of teaching experience, degrees earned and amount of graduate study, and father's occupation.²⁴

Minnesota Teacher Attitude Inventory

The Minnesota Teacher Attitude Inventory was administered to each of the ten teachers who taught the project and

²³See Appendix B.2 for a sample of the student information sheet.

²⁴See Appendix B.3 for a sample of the teacher information sheet.

cooperative methods classes.²⁵ This inventory was selected to measure teacher attitudes in order that estimates might be made of the effect of teacher attitudes on student achievement on the standardized tests.

Processing of the Data

The data concerning the schools, students, and teachers in the study were in five separate categories: (1) socio-economic status information; (2) reading test scores; (3) scores on standardized tests of economic understanding (pre and post), sales comprehension, and sales terms; (4) personal data on all students and the ten distributive education teachers; and (5) scores on the teacher attitude inventory. The several different kinds of data were prepared and processed for analysis in a variety of ways.

Socio-Economic Status

The first step in the preparation of this data for analysis was to check through each of the ten interview sheets to verify that the percentages in each section totaled 100%. Then weightings²⁶ were assigned to each of the statements within each of the categories according to status levels, e.g., 1 = highest status statement, 2 = next

²⁵Minnesota Teacher Attitude Inventory (New York: The Psychological Corporation, 1951).

²⁶Hereford et al., pp. A.4.0-A.4.1.

highest status statement, etc.²⁷ This weighting system was used for each of the first four categories (Area live in, House type, Source of income, and Education) and was totaled to provide the socio-economic index for each school. This procedure netted an index range from 4.00 to 28.00, with a low index indicating a high socio-economic level within the community.

The remaining two groups, racial-ethnic intermix and occupations, were weighted according to the size (percentage) of the groups represented in the student bodies, e.g., 1 = largest proportion, etc. This procedure netted a racial-ethnic intermix index ranging from 1.00 to 4.00, with a low index indicating a low racial-ethnic intermix within the community; and an occupations index ranging from 1.00 to 13.00, with a low index indicating a high occupational level among members of the community.

The socio-economic, the racial-ethnic intermix, and the occupations indices were posted on worksheets²⁸ for each school in preparation for data processing and analysis.

The information on father's occupation used for Duncan's Socio-Economic Index was obtained by means of the student information sheets, filled out by each student in the study

²⁷The status statements are listed in descending order on the instrument. See Appendix B.1.

²⁸A worksheet was prepared for each treatment in each of the ten schools, totaling 40 worksheets.

during the September testing period. The students were directed to provide their father's occupation or the occupation of their mother or guardian if the father were deceased. If the head of the household was unemployed, students were asked to indicate the usual line of work of this person. In a few instances, the researcher had to contact guidance personnel to clarify a student's statement concerning his father's occupation.

Using Duncan's scale,²⁹ the researcher determined the index number applicable for each of the 733 occupations reported by the students. A mean index rating was derived for each school in order to facilitate analysis and comparison of the Duncan index with the occupations index derived from the Messier index, which obtained information from school administrators. The individual and school Duncan index ratings were also entered on worksheets in preparation for data processing.

Student Prior Achievement

After the raw scores were obtained in the Sequential Test of Educational Progress--Reading, Form 2A, a conversion sheet prepared by the publisher was used to convert raw scores to converted scores in order to facilitate comparison with national norms. Both scores were posted on the worksheets.

²⁹See Appendix C.4 for Duncan's Socio-Economic Index.

Standardized Tests of Economic Understanding, Sales Aptitude, and Sales Terms

After the raw scores were obtained on both Forms A and B of the Test of Economic Understanding, they were converted into standard scores provided by the publisher in order to compare these results with national norms. Both the raw and standard scores for the Test of Economic Understanding, along with the raw scores on the Test of Sales Aptitude and Sales Terms Test, were posted on the worksheets.

Personal Data on Students and Teachers

From the student information sheets received from each student, the following information was posted on the worksheets: student's name (coded by number), school, age in years and months, sex, group, and whether the student had had a prior course in economics, sales, retailing, or distributive education.

The information obtained on each of the ten distributive education teachers was posted on a chart which contained the teacher's name, age range, sex, number of years of teaching experience, number of years in this school system, highest degree held, and the number of quarter hours beyond highest degree (see Table 2, p. 54).

Teacher Attitude Inventory

The raw scores obtained on the Minnesota Teacher Attitude Inventory were converted into percentiles and both were posted on the worksheets.

Data Processing

The initial procedure of the data processing involved a statistical analysis of the raw scores of the standardized tests used in the study (STEP-Reading, Form 2A; Test of Economic Understanding, Forms A and B; Test of Sales Aptitude; and Sales Terms Test). After the raw scores were obtained from the Office of Evaluation Services, they were processed on the IBM 1401 Computer, which yielded the mean scores, the standard deviations, and percentile ranks and standard scores for each of the four groups in each school. The Test of Sales Aptitude could not be processed by the 1401 Computer, because of negative scores, which could necessarily result on this test because of its weighting, with a raw score range of -120 to +120. Consequently, this test was processed by the CDC 3600 Computer, which provided mean scores and standard deviations for each of the four groups in each school. This statistical analysis was conducted in order to provide the researcher with information needed to determine the feasibility of more complex statistical comparisons and analyses.

From the worksheets prepared by the researcher and his staff, a data processing card was key punched for each of the 733 students included in the study. These cards contained the following twenty-one variables: school (coded by number); group; age; student (coded by number); STEP (raw score); STEP (converted score); Economics Test Form A

(raw score); Economics Test Form A (converted score); Test of Sales Aptitude score; Sales Terms Test score; Economics Test, Form B (raw score); Economics Test, Form B (converted score); the Duncan Socio-Economic Index (the student's); yes, no, in process, if student had a course in economics; yes/no if student had a course in sales; sex; socio-economic status index (the school's); occupations level (the school's); racial intermix (the school's); the MTAI score (raw); and the MTAI score (in percentiles).

Analysis of the Data

Three statistical procedures were used in the analysis of the total data: (1) simple correlations, (2) t-tests, and (3) analyses of covariance.

Simple Correlations

Nine different treatments of the twenty-one variables were run to obtain simple correlations and mean scores and standard deviations in order to determine the effects, if any, of the independent variables (age, sex, socio-economic status, prior student achievement, and teacher attitude) on the dependent variables (student scores on standardized tests of economic understanding and sales comprehension). The nine runs were as follows: Run I, correlations within the total group--all ten schools and all four groups, 733 observations; Run II, correlations within the total eleventh-grade group--project method classes (group one) and control

classes (group two) in all ten schools, 355 observations; Run III, correlations within the twelfth-grade group-- cooperative method classes (group three) and control classes (group four) in all ten schools, 378 observations; Run IV, correlations within the eleventh-grade project method classes (group one) in all ten schools, 169 observations; Run V, correlations within the eleventh-grade control classes (group two) in all ten schools, 186 observations; Run VI, correlations within the twelfth-grade cooperative method classes (group three) in all ten schools, 188 observations; Run VII, correlations within the twelfth-grade control classes (group four) in all ten schools, 190 observations; Run VIII, correlations within the eleventh-grade project method classes (group one) and the twelfth-grade cooperative method classes (group three) in all ten schools, 357 observations; and Run IX, correlations within the eleventh-grade control classes (group two) and the twelfth-grade control classes (group four) in all ten schools, 376 observations. These data were then analyzed to determine whether a relationship existed between and among the twenty-one variables.

T-Tests

T-tests were computed on the STEP-Reading scores; the Test of Economic Understanding, Forms A and B, scores; the Sales Aptitude Test scores; and the Sales Terms Test scores to determine the significance of the differences of the mean scores obtained by each of the four groups.

Analyses of Covariance

In addition and as a result of the simple correlations that were run, there were performed one-way classification analyses of covariance with respect to scores on the Test of Economic Understanding, Form B, the Test of Sales Aptitude, and the Sales Terms Test--the criterion instruments of this study--, using the scores on the Test of Economic Understanding, Form A, and the STEP-Reading, Form 2A,--pre-test information in this study, as concomitant or auxiliary information.

Group means, rather than individual student scores, were used as the unit of analysis, since the researcher was interested in the total groups, not individual student performance.

Null Hypotheses

In the series of main analyses, the null hypotheses³⁰ under test were:

- Ho₁: that there is no significant difference in student achievement on tests of sales comprehension between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education.
- Ho₂: that there is no significant difference in student achievement on tests of economic understanding between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education.

³⁰See p. 6 for statement of research hypotheses.

- HO₃: that prior achievement, as inferred from scores on the STEP-Reading, Form 2A, is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.
- HO₄: that socio-economic status is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.
- HO₅: that students' age is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.
- HO₆: that sex of students is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.
- HO₇: that teacher attitude, as measured by a teacher attitude inventory, is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

CHAPTER IV

FINDINGS

This chapter presents an analysis and interpretation of the findings of the study. The first section of the chapter reports (1) test results and information compiled which is concerned with the achievement of the students in the study on the tests of prior achievement, economic understanding, and sales comprehension; and (2) additional information compiled on the socio-economic status of the school communities and the students, teacher attitude, and other personal data on the students and teachers. The second section of the chapter includes the findings from calculations of simple correlations and t-tests among these variables, the interpretation of the analyses of covariance among them, and tests of the stated hypotheses and summary.

Student Achievement on Standardized Tests and Collateral Data

Student Prior Achievement

The STEP-Reading, Form 2A, scores were used as indicators of students' prior achievement as a measure of the homogeneity of the population. When grand mean scores for each group in the ten schools were observed; the grand mean

scores of the two control groups (English and social science), groups two and four, were higher than the grand mean scores of the two treatment groups (distributive education), groups one and three. In the eleventh grade, the control group students scored, on the whole, in the range of one percentile band higher than the distributive education project group students. In the twelfth grade, the control group students scored, on the whole, in the range of four percentile bands higher than the distributive education cooperative group students. In general, the control group students in all ten schools indicated greater reading ability, and thus were most likely academically more able students, than the distributive education students. In some cases, however, (4 out of the 40), the eleventh- or twelfth-grade distributive education students, as a group, did score higher than their control classes.

Table 4 presents the STEP-Reading mean raw scores,¹ the standard deviations, and the appropriate percentile bands (for eleventh- or twelfth-grade, based on national norms) for each group in each of the ten schools. Also represented on the table are the mean raw scores and the standard deviations of each group as a total. For group one, the mean raw score was 41.20, with mean scores ranging from 30.79 to 49.22. For group two, the mean raw score

¹The STEP-Reading contains seventy items and the raw scores indicate number of right responses out of seventy.

Table 4. Means, Standard Deviations, and Percentile Bands for Each of the Four Groups in Each of the Ten Schools—STEP-Reading, Form 2A

School Code Number	Group 1 (11th-Grade Project)			Group 2 (11th-Grade Control)			Group 3 (12th-Grade Cooperative)			Group 4 (12th-Grade Control)		
	Mean	S.D.	Percentile	Mean	S.D.	Percentile	Mean	S.D.	Percentile	Mean	S.D.	Percentile
1	40.33	8.67	28-44	42.50	8.50	36-54	41.64	8.19	20-42	48.65	5.48	44-63
2	36.19	10.43	22-36	44.56	8.36	40-58	47.17	5.10	40-58	41.15	11.80	20-42
3	43.77	9.77	40-58	47.00	11.44	49-67	45.34	7.67	30-48	51.44	7.88	48-66
4	30.79	9.97	11-25	39.39	11.37	28-44	38.00	9.51	17-33	36.67	11.68	17-33
5	38.47	8.86	25-40	39.00	8.14	28-44	42.58	9.71	24-46	50.94	7.88	48-66
6	45.00	9.25	40-58	47.34	11.54	49-67	37.50	14.08	17-33	50.44	8.17	48-66
7	43.13	10.40	36-54	40.13	9.89	28-44	41.00	8.20	20-42	45.35	9.21	30-48
8	49.22	6.08	54-71	41.40	11.99	31-49	42.29	9.86	20-42	45.89	12.61	35-53
9	46.24	6.80	44-62	45.36	9.29	40-58	37.00	12.31	17-33	44.73	9.13	30-48
10	40.79	11.39	31-49	42.87	10.24	36-54	42.04	7.17	20-42	52.73	8.07	55-80
Totals	41.20	10.32	31-49	43.49	10.59	36-54	41.93	9.17	20-42	47.20	10.44	40-58

was 43.49, with means ranging from 39.00 to 47.34. For group three, the mean raw score was 41.39, with means ranging from 37.00 to 47.17. For group four, the mean raw score was 47.20, with means ranging from 36.67 to 52.73.

Tests for the Economic Understanding Competency

Tests of Economic Understanding: The Test of Economic Understanding was administered in pre- and post-test situations. On the pre-test, Form A (see Table 5), the control group (non-distributive education students), on the whole, scored higher than the distributive education students. In the eleventh-grade, the mean score² for the distributive education project group students was 16.96, whereas the mean score for the control group students was 18.54. However, the six-point difference between the percentile ranks of the two groups indicates a wide difference between the project and the control group students. In the twelfth grade, the distributive education cooperative group students' mean score was 18.18; the control group students', 21.80. Again, the wide difference between the two percentile ranks, 13 to 31, is indicative of a significant initial difference in economic understanding between the two twelfth-grade groups. It may be observed, however, that the proportion of differences in mean scores for the four groups on this test is

²The Test of Economic Understanding contains fifty items and the score indicates number right out of fifty.

Table 5. Means, Standard Deviations, and Percentile Ranks for Each of the Four Groups in Each of the Ten Schools—Test of Economic Understanding, Form A (Pre-Test)

School Code Number	Group 1 (11th-Grade Project)			Group 2 (11th-Grade Control)			Group 3 (12th-Grade Cooperative)			Group 4 (12th-Grade Control)		
	Mean	S.D.	Percentile	Mean	S.D.	Percentile	Mean	S.D.	Percentile	Mean	S.D.	Percentile
1	15.53	4.72	8	16.33	4.63	8	17.23	6.68	13	22.64	4.65	39
2	16.50	4.20	13	19.39	4.98	19	18.75	4.43	19	19.70	5.14	26
3	18.97	5.46	19	19.11	5.02	9 ^a	20.00	4.38	26	26.94	5.27	31 ^a
4	15.37	4.67	8	17.78	5.15	13	17.12	4.90	13	18.39	5.86	13
5	14.93	4.76	8	16.00	5.68	8	17.63	5.17	6 ^a	25.06	6.49	25 ^a
6	17.15	4.41	13	19.48	4.58	19	14.63	4.05	8	21.70	4.83	31
7	15.13	3.81	8	17.33	5.65	13	18.32	5.51	13	21.88	5.78	31
8	21.11	4.86	31	16.93	4.48	13	16.00	6.03	8	20.93	6.26	31
9	17.29	5.15	13	20.59	4.59	31	21.67	2.25	31	19.55	6.10	26
10	17.36	6.33	13	20.22	7.57	26	19.89	4.25	26	23.32	5.63	39
Totals	16.96	5.08	13	18.54	5.51	19	18.18	5.21	13	21.80	5.94	31

^aConverted to percentile rank comparisons for students with prior economics instruction.

similar to the differences in mean scores observed on the STEP-Reading (see Table 4).

On the post-test, Form B (see Table 6), the distributive education students, on the whole, showed an improvement in their scores on the economic understanding test. Although the mean scores for the eleventh-grade project group were 16.96 and 17.66 on Forms A and B respectively, the percentile rank increased by six points on the post-test. The eleventh-grade control classes, on the whole, made no improvement in the scores. The twelfth-grade cooperative group also substantially increased their scores on the post-test, in terms of increase in percentile rank, from 13 to 19. The twelfth-grade control group also made a marked improvement from the pre- to the post-test on economic understanding from 31 to 39.

To understand better Tables 5 and 6 it must be noted that some students in the population had had a prior course in economics. Since more than fifty per cent of the students in four of the classes (school #3, groups two and four, and school #5, groups three and four) had had such a course prior to the testing period, the percentile rank comparisons for these four classes were computed from a table for students with prior economic instruction. Since only four of the forty classes were involved, the researcher did not consider the number significant enough to make a difference in the totals.

Table 6. Means, Standard Deviations, and Percentile Ranks for Each of the Four Groups in Each of the Ten Schools—Test of Economic Understanding, Form B (Post-Test)

School Code Number	Group 1 (11th-Grade Project)			Group 2 (11th-Grade Control)			Group 3 (12th-Grade Cooperative)			Group 4 (12th-Grade Control)		
	Mean	S.D.	Percentile	Mean	S.D.	Percentile	Mean	S.D.	Percentile	Mean	S.D.	Percentile
1	16.47	5.55	8	16.06	5.68	8	19.00	5.18	19	19.36	4.63	19
2	17.13	4.08	13	20.28	4.78	26	19.17	4.26	19	20.85	6.56	31
3	19.45	4.86	19	22.89	6.49	19 ^a	19.28	5.73	19	27.38	6.95	35 ^a
4	15.74	3.83	8	16.89	5.63	13	15.00	4.84	5	16.83	5.14	13
5	17.13	6.35	13	18.60	3.69	19	18.42	3.73	9 ^a	23.33	7.98	19 ^a
6	18.08	5.24	19	18.41	5.73	19	14.50	2.85	5	21.48	6.74	31
7	17.56	4.00	19	19.53	5.44	26	18.52	4.67	19	23.12	5.41	39
8	21.78	6.10	39	17.20	2.83	13	16.86	6.57	13	20.22	7.26	26
9	16.24	4.46	8	20.68	6.67	31	19.33	6.06	19	18.00	6.96	19
10	18.00	5.48	19	20.74	8.08	31	19.14	4.77	19	25.68	5.89	63
Totals	17.66	5.04	19	19.12	6.24	19	18.09	5.07	19	21.72	6.96	39

^aConverted to percentile rank comparisons for students with prior economics instruction.

Tests for the Sales Comprehension Competency

Test of Sales Aptitude and Sales Terms Test: The sales comprehension competency was measured by two post-tests, the Test of Sales Aptitude and the Sales Terms Test. No student in groups one (eleventh-grade distributive education project method), two (eleventh-grade non-distributive education), and four (twelfth-grade non-distributive education) had had a prior course in sales, retailing, or distributive education. In five of the ten classes in group three, the twelfth-grade cooperative method classes, all of the students had had such a course. A few students (13) in the other five classes also had had a course.

The mean scores³ on the Test of Sales Aptitude (see Table 7) indicated that, on the whole, group one, the distributive education project group students, scored only slightly higher than the eleventh-grade control group. The twelfth-grade distributive education cooperative group, however, scored lower, on the whole, than the twelfth-grade control group, though the cooperative group did score higher than both eleventh-grade groups. The results on this test of knowledge of basic selling principles indicated, therefore, that the twelfth-grade distributive education cooperative students performed, on the whole, better than the eleventh-grade distributive education project students; and

³Possible scores on the Test of Sales Aptitude range from -120 to +120.

Table 7. Means, Standard Deviations, and Percentile Ranks for Each of the Four Groups in Each of the Ten Schools-Test of Sales Aptitude

School Code Number	Group 1 (11th-Grade Project)		Group 2 (11th-Grade Control)		Group 3 (12th-Grade Cooperative)		Group 4 (12th-Grade Control)	
	Mean	S.D. Percentile	Mean	S.D. Percentile	Mean	S.D. Percentile	Mean	S.D. Percentile
1	16.20	19.26 32	14.83	24.28 30	18.14	19.26 36 ^a	18.79	18.88 38
2	1.94	11.72 11	14.28	9.42 28	23.67	14.60 50 ^a	22.30	15.01 45
3	10.16	15.66 20	15.22	14.07 30	15.87	13.70 32	20.63	15.89 43
4	11.00	18.55 22	10.78	14.68 22	15.44	17.25 30	13.50	15.03 28
5	11.73	17.47 23	13.70	25.17 28	17.42	14.09 34	23.44	26.96 47
6	17.85	19.20 36	11.48	18.10 22	21.44	21.08 43 ^a	21.67	16.29 45
7	16.75	20.50 34	12.87	20.19 25	15.80	19.61 32 ^a	18.18	15.72 36
8	19.22	14.25 38	16.40	11.05 32	25.29	17.31 53	20.63	14.66 43
9	16.05	18.17 32	13.41	16.19 25	9.17	20.53 19	18.27	19.16 36
10	19.86	18.14 40	14.61	11.40 30	13.18	19.37 25 ^a	28.00	20.34 62
Totals	13.56	17.62 28	13.46	16.28 25	17.52	17.47 36	20.82	17.08 43

^aAll students in these classes had had a prior course in sales, retailing, or distributive education.

both treatment groups scored either lower or roughly equal to their control groups.

The mean scores⁴ on the Sales Terms Test (see Table 8) revealed that neither treatment group scored higher than the corresponding control group. The eleventh-grade distributive education project group scored two points lower than the eleventh-grade control group, though both mean scores fell in the same percentile band. The twelfth-grade distributive education cooperative group scored approximately 1.5 points lower than the control group but in the same percentile band. And, the twelfth-grade cooperative group scored approximately three points higher than the eleventh-grade project group.

Socio-Economic Status

Information obtained from the school administrators, using the Messier Index, revealed that nine of the ten schools in the study had computed socio-economic indices which tended to cluster about the middle of the scale (16.00 in the 4.00-28.00 range). The socio-economic index included the four categories: area live in, house type, source of income, and education of head of household. Weightings could range from 4.00 to 28.00, with a low index indicating a high socio-economic level within the school community. In this study, the socio-economic indices ranged

⁴The Sales Terms Test contains fifty-four items and scores indicate number right out of fifty-four.

Table 8. Means, Standard Deviations, and Percentile Bands for Each of the Four Groups in Each of the Ten Schools-Sales Terms Test

School Code Number	Group 1 (11th-Grade Project)		Group 2 (11th-Grade Control)		Group 3 (12th-Grade Cooperative)		Group 4 (12th-Grade Control)	
	Mean	S.D. Percentile	Mean	S.D. Percentile	Mean	S.D. Percentile	Mean	S.D. Percentile
1	19.13	6.14 24-39	21.11	4.20 24-39 ^a	22.09	5.61 24-39 ^a	24.43	4.85 40-59
2	19.81	6.37 24-39	24.00	6.11 40-59	23.67	5.52 40-59 ^a	21.45	5.61 24-39
3	21.29	5.13 24-39	23.94	5.16 40-59	22.00	5.23 24-39	25.94	6.05 40-59
4	17.68	3.59 12-23	21.00	4.09 24-39	21.76	4.44 24-39	18.50	7.91 24-39
5	16.87	6.51 12-23	19.80	5.10 24-39	21.26	5.27 24-39	27.22	6.83 40-59
6	21.54	5.81 24-39	24.76	5.11 40-59	22.13	5.21 24-39 ^a	26.93	5.28 40-59
7	22.19	4.61 24-39	24.60	6.09 40-59	26.32	4.11 40-59 ^a	22.12	6.99 24-39
8	21.22	5.56 24-39	19.80	6.04 24-39	19.71	6.33 24-39	25.74	6.22 40-59
9	21.24	5.24 24-39	21.55	5.35 24-39	24.33	3.93 40-59	21.18	3.54 24-39
10	22.71	7.92 40-59	22.65	6.82 40-59	22.18	4.31 24-39 ^a	27.05	4.46 40-59
Totals	20.35	5.78 24-39	22.42	5.85 24-39	22.59	5.32 40-59	24.39	6.47 40-59

^aAll students in these classes had had a prior course in sales, retailing, or distributive education.

from 9.74 to 17.95, with a mean index of 15.32. With the exception of the school with the lowest index (9.74), the indices of the other nine schools were generally similar, varying within a total range of only 3.76 points, indicating that the nine school communities were average, middle-class communities in terms of socio-economic level (see Table 9).

Table 9. Socio-Economic Status Data for the Ten School Communities (Messier Index)

School Code Number	Socio-Economic Index	Racial-Ethnic Intermix Index	Occupations Index
1	17.95	1.70	7.25
2	16.90	1.28	9.22
3	9.74	1.65	3.33
4	16.31	2.40	6.70
5	15.56	2.20	7.22
6	15.71	2.26	5.87
7	16.04	2.43	8.10
8	14.54	1.42	8.50
9	16.22	1.80	7.25
10	14.19	1.62	8.33
Mean	15.32	1.88	7.18

The low ratings computed for the racial-ethnic intermix index for the ten school communities (all ten were below

the 2.50 or middle index) indicated that the school communities included in the study were composed of generally homogeneous populations. That is, the communities each had a low proportion of mixed types of racial and ethnic groups. The racial-ethnic intermix index could range from 1.00 to 4.00, with a low index indicating a low racial and ethnic intermix within the community. The racial-ethnic intermix indices of the ten school communities ranged from 1.28 to 2.43, with a mean of 1.88 (see Table 9).

The occupations index could range from 1.00 to 13.00, with a low index indicating a high occupational status (e.g., lawyer, minister, teacher, architect, manager) among members of the community. In the study, the indices of the school communities ranged from 3.33 to 9.22, with a mean of 7.18 (see Table 9). Three of the communities had occupations indices which were above the middle level (indicated by a rating of 7.00 or less) of occupational status, which indicated that most of the communities were composed of people who were employed in such occupations as farming, sales, building trades, industrial workers, etc.

The results of the computations of the Duncan Index, which is based on the occupation of the head of household for each student in the study, were in agreement with the portion of the Messier Index that rated the occupational level of the school communities. On the Duncan Index, a high number (00-99 range) indicates a high or prestigious

occupational level among the families of the students in the study. The mean index for the ten schools was 40.6, with the mean indices for each of the ten schools ranging from 26.5 to 60.7 (see Table 10). The Duncan Index revealed much the same information, then, as the Messier Index, in that most of the population of the school communities was employed in occupations of the middle- or low-prestige job classification. The similarity in results on the Duncan Index and the Messier Index indicated that the students enrolled in each of the four groups in the ten schools were from families comparable to others in their schools.

Table 10. Socio-Economic Data Based on Occupation of Head of Household for the Four Groups in the Schools (Duncan Index)

School Code Number	Number of Students in Population	Duncan Index Mean
1	69	36.5
2	66	34.2
3	94	60.7
4	72	26.5
5	62	50.0
6	85	38.8
7	73	29.5
8	65	36.6
9	60	38.3
10	87	47.6
Total	733	40.6

Table 11 illustrates the Duncan Index information for each group within the total ten schools. For group one, the mean index of all students in all ten schools was 38.4, with mean indices ranging from 19.6 to 61.3. For group two, the overall mean index was 42.4, with a range of mean indices from 25.5 to 64.2. For group three, the overall mean index was 37.7, with a range of mean indices from 23.9 to 52.7. For group four, the overall mean index was 43.6, with a range of mean indices from 30.0 to 70.2. Although the mean indices varied widely within each group computed for each school, when a total mean index was computed for each group, the mean indices were quite close. For example, in group two, the ten mean indices computed ranged from 25.5 to 64.2, whereas the four total mean indices only varied from 37.7 to 43.6. Considering, then, the total population, the students were homogeneous in terms of socio-economic status as measured by the Duncan Index.

Personal Data on Students and Teachers

Students: Much of the information obtained from the student information sheets has already been discussed, in terms of numbers of boys and girls in each group in each school (see Table 3, p. 56). Information regarding father's occupation was used to compute the Duncan Index (see Tables 10 and 11, pp. 20 and 92).

Of the 733 students in the population, only 86 (12%) had had a course in economics. The 86 students were members

Table 11. Socio-Economic Data Based on Occupation of Head of Household for Each Group in the Schools (Duncan Index)

School Code Number	Group 1 (11th-Grade Project) Number of Students	Index Mean	Group 2 (11th-Grade Control) Number of Students	Index Mean	Group 3 (12th-Grade Cooperative) Number of Students	Index Mean	Group 4 (12th-Grade Control) Number of Students	Index Mean
1	15	28.9	18	34.1	22	37.2	14	46.6
2	16	40.2	18	32.3	12	35.8	20	30.0
3	31	61.3	18	64.2	29	52.7	16	70.2
4	19	22.0	18	25.5	17	23.9	18	34.1
5	15	43.1	10	49.3	19	43.8	18	62.7
6	13	25.1	29	39.3	16	37.4	27	45.5
7	16	19.6	15	35.7	25	28.3	17	34.8
8	9	54.7	15	41.2	14	27.4	27	32.8
9	21	29.4	22	45.4	6	34.3	11	37.4
10	14	45.2	23	55.0	28	41.8	22	47.7
Total	169	38.4	186	42.4	188	37.7	190	43.6

of one of four classes (see Table 6, p. 83). Students who had had a prior course in sales, retailing, or distributive education comprised five entire classes of group three (see Table 7, p. 85), with an additional thirteen students scattered throughout the other five group three classes. These 116 students represented 16% of the total population (733) and 62% of the group three population (188).

Table 12 shows the mean age for the students in each group in each of the ten schools. As could be expected, there was a 9-12 month difference in the mean age between the eleventh and twelfth graders. For group one, the mean age was 16.6, with a range of 16.3 to 17.2. For group two, the mean age was 16.4, with a range of 16.2 to 16.8. For group three, the mean age was 17.3, with a range of 16.7 to 17.6. For group four, the mean age was 17.4, with a range of 17.2 to 17.6.

Table 13 shows the means and standard deviations for scores on the five standardized tests, presented by group and indicating girls' and boys' scores separately.

Teachers: All of the pertinent information obtained from the ten distributive education teachers appears on Table 2, p. 54.

Teacher Attitude: As a measure of teacher attitudes, which might have had an effect on student achievement on the standardized tests, the Minnesota Teacher Attitude Inventory was administered to the ten distributive education

Table 12. Mean Age of Student Population Indicated by Group and School

School Code Number	Group 1 (11th-Grade Project)	Group 2 (11th-Grade Control)	Group 3 (12th-Grade Cooperative)	Group 4 (12th-Grade Control)
1	16.6	16.4	17.6	17.5
2	16.6	16.4	17.3	17.6
3	16.3	16.2	17.6	17.4
4	16.6	16.2	17.0	17.3
5	16.5	16.4	17.5	17.2
6	16.6	16.2	17.4	17.2
7	16.6	16.5	17.4	17.4
8	17.2	16.8	17.3	17.5
9	16.3	16.4	17.5	17.3
10	16.7	16.3	16.7	17.2
Totals	16.6	16.4	17.3	17.4

Table 13. Means and Standard Deviations for the Five Standardized Tests Indicated by Groups for Boys and Girls Separately

Test	Group 1 (11th-Grade Project) Girls Boys	Group 2 (11th-Grade Control) Girls Boys	Group 3 (12th-Grade Cooperative) Girls Boys	Group 4 (12th-Grade Control) Girls Boys
STEP- Reading	Mean SD 42.65 38.49 10.27 10.15	44.46 42.41 9.99 10.90	43.90 39.52 7.45 10.45	45.28 48.92 12.14 8.15
Economics, A	Mean SD 16.65 17.47 4.69 5.73	18.08 19.15 5.05 5.84	18.51 17.74 4.60 5.85	20.21 23.74 5.77 5.63
Economics, B	Mean SD 17.55 17.71 4.56 6.01	18.30 20.35 5.41 6.72	18.08 18.03 4.73 5.48	19.86 23.53 6.50 6.94
Sales Aptitude	Mean SD 14.04 12.17 17.60 17.88	13.43 13.82 15.53 17.41	17.80 16.71 17.90 17.52	19.45 22.33 16.95 17.24
Sales Terms	Mean SD 19.91 21.20 5.83 5.66	21.75 23.43 5.48 5.65	21.90 23.28 4.49 5.86	22.75 25.59 6.52 6.20

teachers. Table 14 presents the raw scores and the appropriate percentile rank for the distributive education teachers, the teachers of treatment groups one and three. The MTAI was scored on a right minus wrong basis, with possible scores ranging from -150 to +150.

Table 14. MTAI Scores and Percentile Ranks for the Ten Distributive Education Teachers

Teacher ^a	Score	Percentile Rank
1	42	62*
2	55	74*
3	36	54*
4	52	82
5	50	81
6	50	81
7	38	74
8	-5	24*
9	-5	35
10	42	76
Mean:	35.9	
S.D.:	20.1	

^aListed by school code number.

* Computed on table for vocational high school teachers with five years of preparation; all others, four years of preparation.

Interpretation of the Statistical Tests

Simple Correlations and T-Tests

Simple correlations and t-tests were computed to determine the relationships between and among the variables in the study. Analyses and interpretations of these statistical tests⁵ are presented in terms of students' prior achievement, student achievement on the tests for the economic understanding and sales comprehension competencies, socio-economic status, and the additional personal data on the students and teachers.

Student Prior Achievement: A perusal of the correlations coefficients computed on the total group revealed that the scores received on the STEP-Reading correlated significantly with the scores on the other four standardized tests (with Economics, Form A, .538; with Economics, Form B, .512; with Sales Aptitude, .335; with Sales Terms, .527). When correlations were run on an individual group basis, the coefficients of correlation were highly significant in each case. Table 15 shows the correlations for the STEP-Reading with the other standardized tests for each group and for the total group.

As a further test of significance of prior achievement, t-tests,⁶ were computed on the STEP-Reading scores for three

⁵The .05 level of confidence was used in all analyses.

⁶Allen L. Edwards, Statistical Methods for the Behavioral Sciences (New York: Holt, Rinehart and Winston, 1961), p. 254.

Table 15. Correlations of STEP-Reading⁷ and Four Other Standardized Tests for Each Group and the Total Group

Test	Group 1 11th-Grade Project (N=169)	Group 2 11th-Grade Control (N=186)	Group 3 12th-Grade Cooperative (N=188)	Group 4 12th-Grade Control (N=190)	Total Group (N=733)
Economics, A	.490	.489	.402	.617	.538
Economics, B	.503	.475	.316	.591	.512
Sales Aptitude	.374	.329	.298	.282	.335
Sales Terms	.565	.535	.259	.615	.527

The level of significance for Group 1 is .152; Group 2, .144; Group 3, .144; Group 4, .143; Total Group, .076.⁸

⁷Since the intercorrelations between the raw and converted scores of all the standardized tests were highly significant (ranging from .986 to .996), the researcher used the correlations for raw scores and means of raw scores in the analyses.

⁸Edwards, p. 502.

combinations of groups: groups one and three (between project method classes and cooperative method classes), groups one and two (between project method classes and eleventh-grade control classes), and groups three and four (between cooperative method classes and twelfth-grade control classes). The results of the t-tests showed that the differences between the mean scores were highly significant (at the .05 level of confidence⁹) when comparing each of the distributive education groups (project and cooperative methods) with their respective control classes, with the control classes scoring higher. Tables 16, 17, and 18 present the t-test results and indicate the statistical significance.

Since there existed a significant relationship between students' reading comprehension scores and scores obtained on the other tests, together with high levels of significance of differences between mean scores on the STEP-Reading between the project and cooperative method classes and their control classes, the variable of reading comprehension was included as a covariate in the analyses of covariance. At this point, therefore, the null hypothesis H_{03} that prior achievement, as inferred from scores in the STEP-Reading, Form 2A, is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and

⁹Ibid., p. 501.

Table 16. Means and T-Tests for the Two Distributive Education Groups on the STEP-Reading

Test	Group 1 11th-Grade Project Means (N=169)	Group 3 12th-Grade Cooperative Means (N=188)	Values of t
STEP-Reading	41.20	41.93	-.63

Table 17. Means and T-Tests for the Eleventh-Grade Groups on the STEP-Reading

Test	Group 1 11th-Grade Project Means (N=169)	Group 2 11th-Grade Control Means (N=186)	Values of t
STEP-Reading	41.20	43.49	8.48*

* Significant at the .05 level of confidence, tabled value of 1.96.

Table 18. Means and T-Tests for the Twelfth-Grade Groups on the STEP-Reading

Test	Group 3 12th-Grade Cooperative Means (N=188)	Group 4 12th-Grade Control Means (N=190)	Values of t
STEP-Reading	41.93	47.20	4.15*

* Significant at the .05 level of confidence, tabled value of 1.96.

sales comprehension, could neither be accepted nor rejected until further statistical analyses were made.

Tests of Economic Understanding and Sales Comprehension: In order to determine the significance of the differences of the mean scores obtained by each of the groups on the four standardized tests included in this area, t-tests were computed on three combinations of the groups:

- (1) groups one and three, to examine differences between the two different distributive education methods classes;
- (2) groups one and two, to examine differences between the eleventh-grade project method and control classes; and
- (3) groups three and four, to examine differences between the twelfth-grade cooperative method and control classes.

Tables 19, 20, and 21 present the results of these computations and indicate which of the differences between means are significant (at the .05 level of confidence, tabled value of 1.96), for groups one and three, one and two, and three and four, respectively.

It would seem from the results indicated on Table 19 that there was a significant difference between the mean scores of the project method classes and the cooperative method classes on these four tests, with the cooperative method classes scoring higher. There were also significant differences indicated between the project method classes and the control classes on the Test of Economic Understanding, Form A, and the Sales Terms Test, with the control

Table 19. Means and T-Tests for the Two Distributive Education Groups on the Four Standardized Tests

Test	Group 1 11th-Grade Project Means (N=169)	Group 3 12th-Grade Cooperative Means (N=188)	Values of t
Economics, A	16.96	18.18	-9.38*
Economics, B	17.66	18.09	14.33*
Sales Aptitude	13.56	17.52	-26.40*
Sales Terms	20.35	22.59	-4.87*

* Significant at the .05 level of confidence.

Table 20. Means and T-Tests for the Eleventh-Grade Groups on the Four Standardized Tests

Test	Group 1 11th-Grade Project Means (N=169)	Group 2 11th-Grade Control Means (N=186)	Values of t
Economics, A	16.96	18.54	3.67*
Economics, B	17.66	19.12	1.21
Sales Aptitude	13.56	13.46	-.07
Sales Terms	20.35	22.42	29.57*

* Significant at the .05 level of confidence.

Table 21. Means and T-Tests for the Twelfth-Grade Groups on the Four Standardized Tests

Test	Group 3 12th-Grade Cooperative Means (N=188)	Group 4 12th-Grade Control Means (N=190)	Values of t
Economics, A	18.18	21.80	4.96*
Economics, B	18.09	21.72	1.92
Sales Aptitude	17.52	20.82	-8.46*
Sales Terms	22.59	24.39	1.57

* Significant at the .05 level of confidence.

classes scoring higher; and between the cooperative method classes and the control classes on the Test of Economic Understanding, Form A, and the Test of Sales Aptitude, with the control classes scoring higher (Tables 20 and 21).

All three sets of groups, then, showed significant differences between means on the Test of Economic Understanding, Form A, a pre-test. Observation of the simple correlations between the Economics A test and the other three tests also revealed significance. Table 22 indicates the correlations for the Economics A test with the Test of Economic Understanding, Form B, the Test of Sales Aptitude, and the Sales Terms Test, for these three combinations of groups.

Table 22. Correlations of the Test of Economic Understanding Form A, and the Three Other Standardized Tests for Each of the Three Combinations of Groups

Test	Groups 1 & 3 Project and Cooperative (N=357)	Groups 1 & 2 Project and 11th Control (N=355)	Groups 3 & 4 Cooperative and 12th Control (N=378)
Economics, B	.512	.572	.593
Sales Aptitude	.275	.258	.296
Sales Terms	.440	.511	.477

The level of significance for Treatments 1 and 3 is .105; Treatments 1 and 2, .105; Treatments 3 and 4, .101.

In order to derive a clearer picture of the relationship of the standardized test scores for the groups, the variable of prior economic understanding, as measured by the pre-test, was also included as a covariate in the analyses of covariance. In addition, before arriving at a decision to accept or reject the appropriate hypotheses (H_{01} and H_{02}), that there is no significant difference in student achievement on tests of economic understanding and sales comprehension between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education, several other variables had to be considered.

Socio-Economic Status: Four of the variables were considered in the analysis of the correlation between socioeconomic status and student achievement on the several standardized tests: the Duncan Index, the Socio-Economic Index, the Racial-Ethnic Intermix Index, and the Occupations Index. When the correlation coefficients were observed for the total group (733), the information obtained through the Messier Index (Socio-Economic Index, Racial-Ethnic Intermix Index, and Occupations Index) showed internal correlation but a negative correlation with the Duncan Index. The Messier Index information showed no significant correlation with the scores of the standardized tests, although the Duncan Index correlates significantly with four of the five tests--the

STEP-Reading, the Tests of Economic Understanding, Forms A and B, and the Sales Terms Test. Table 23 shows the coefficients of correlation between these variables.

Table 23. Correlations Between the Socio-Economic Indices and the Standardized Tests

Index	STEP-Reading*	Economics, Form A	Economics, Form B	Sales Aptitude	Sales Terms
Socio-Economic Index	-.129	-.151	-.181	-.002	-.063
Racial-Ethnic Index	-.105	-.087	-.102	-.041	.006
Occupations Index	-.076	-.074	-.054	.047	-.013
Duncan Index	.155	.157	.157	.021	.132

The level of significance for N-2df (731) at $p < .05$ is .076 (two-tailed tests).

On the basis of these sporadic correlations, the variable of socio-economic status was not considered to be a significant factor and was consequently not included in the analyses of covariance.

Therefore, the null hypothesis (H_0) that socio-economic status is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension, was accepted.

Personal Data on Students: The variables included in this area were prior course in economics; prior course in sales, retailing or distributive education; age of student; and sex of student. No correlations between either type of prior course and/or age of students and scores on the standardized tests were found to be significant. As a study of Tables 5, 6, 7, and 8¹⁰ revealed, the students who had had a prior course in economics (only 4 of the 40 classes involved) and the students who had had a prior course in sales (members of 5 of the 10 classes in group 3) did not score significantly different from their peers, which accounted for the lack of significant correlation in each of the total groups.

As shown in Table 12,¹¹ there was a slight age difference between the four groups of students. Consequently, statistical analysis revealed a lack of correlation between age and test scores. As a result, the null hypothesis (H_{05}) that students' age is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized tests scores in economic understanding and sales comprehension, was accepted.

To discover the extent of the significance of the differences between the means of the standardized test scores between girls and boys, t-tests were computed. Table 24

¹⁰See pages 81, 83, 85, and 87.

¹¹See page 94.

Table 24. Means and T-Tests for Boys and Girls in Groups One, Two, Three, and Four for the Five Standardized Tests

Test	Group 1 11th-Grade Project Girls Boys Value of t		Group 2 11th-Grade Control Girls Boys Value of t		Group 3 12th-Grade Cooperative Girls Boys Value of t		Group 4 12th-Grade Control Girls Boys Value of t					
STEP-Reading	42.65	38.49	34.67*	44.46	42.41	-2.25*	43.90	39.52	-1.46	45.28	48.92	- 0.91
Economics A	16.65	17.47	.78	18.08	19.15	1.35	18.51	17.74	- .62	20.21	23.74	-25.21*
Economics B	17.55	17.71	.11	18.30	20.35	1.56	18.08	18.03	- .07	19.86	23.53	8.34*
Sales Aptitude	14.04	12.17	6.68*	13.43	13.82	.21	17.80	16.71	2.87*	19.45	22.33	9.93*
Sales Terms	19.91	21.20	7.59*	21.75	23.43	9.88*	21.90	22.75	1.01	22.75	25.59	-8.88*

* Significant at the .05 level of confidence, tabled value of 1.96.

indicates the values of t and indicates which are significant at the .05 level of confidence.

The sporadic significance between means indicated by the t -tests, coupled with the total lack of correlation between sex and the test scores as shown in the simple correlations, led to the acceptance of the null hypothesis (H_0) that sex of students is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

Teacher Attitude: Observation of the simple correlations run on groups one and three (the groups involving the ten distributive education teachers) revealed low coefficients of correlation between teacher attitude inventory (MTAI) scores and student scores on the five standardized tests. Table 25 shows these correlations.

Table 25. Correlations of Teacher Attitude Scores and Student Scores on the Five Standardized Tests for Groups 1 and 3

Test	Group 1 11th-Grade Project (N=169)	Group 3 12th-Grade Cooperative (N=188)
STEP-Reading	-.324	.108
Economics, A	-.175	-.032
Economics, B	-.068	-.033
Sales Aptitude	-.120	-.023
Sales Terms	-.125	.060

The level of significance for Treatment 1 is .152; for Treatment 3, .144.

The null hypothesis (H_{07}) that teacher attitude, as measured by a teacher attitude inventory, is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension, was accepted.

Interpretation of the Analyses of Covariance

To obtain a clearer and more precise interpretation of the significance of the test scores, one-way classification analyses of covariance were performed with respect to scores on the Test of Economic Understanding, Form B, the Test of Sales Aptitude, and the Sales Terms Test (the three criterion instruments), using scores on the Test of Economic Understanding, Form A, and the STEP-Reading, Form 2A, (pre-test data) as concomitant information. The purpose was to adjust for the initial differences between the groups of students. The unit of analysis was group means, and analyses of covariance were computed for the total eleventh-grade group--groups one and two--(Table 29), for the total twelfth-grade group--groups three and four--(Table 30), and for the total distributive education groups--the project and cooperative groups, one and three--(Table 31). These three tables may be found in Appendix D, pp. 171-173.

As the simple correlations and the t-tests indicated, the variable of prior achievement, as measured by the STEP-Reading, and the variable of economic understanding, as measured by the pre-test Test of Economic Understanding,

Form A, both had an effect on students' scores on the three criterion instruments. For the eleventh-grade, prior achievement had a significant effect on students' scores on the Test of Sales Aptitude, The Sales Terms Test, and the Test of Economic Understanding, Form B (see Table 29). For the twelfth-grade, prior achievement had a significant effect on students' scores on the Test of Sales Aptitude, the Sales Terms Test, and the Test of Economic Understanding, Form B (see Table 30). For the two treatment groups, prior achievement had a significant effect on students' scores on the Test of Sales Aptitude and the Test of Economic Understanding, Form B (see Table 31).

On the basis of these results, coupled with the significant correlations of the STEP-Reading and the Test of Economic Understanding, Form A, with each of the other test results, and the significance of the t-test results, the evidence compiled indicated the significance of prior achievement between distributive education and non-distributive education students. However, in terms of the null hypothesis (H_{03}), there is no evidence indicating that prior achievement is of significance in assessing the effectiveness of the two methods of instruction. Consequently, since the project and cooperative method groups were not significantly different in prior achievement (reading ability), the null hypothesis (H_{03}) that prior achievement, as inferred from scores in the STEP-Reading, Form 2A, is of no significance in assessing the effectiveness of each of the two

methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension was accepted.

Means on the three criterion instruments (Test of Sales Aptitude, Sales Terms Test, Test of Economic Understanding, Form B) were adjusted after initial differences in the groups were accounted for and F tests were computed. Tables 26, 27, and 28 present the adjusted means, the F results, and the significance for the three combinations of groups. When initial differences between students in the eleventh-grade groups (groups one and two) were adjusted for through the analysis of covariance, there was no significant difference between the scores of the two groups on any of the three tests. The same results occurred for the twelfth-grade groups (groups three and four). However, Table 28 indicates significance between the project method and the cooperative method students in the sales aptitude and sales terms tests. This indicated that the cooperative method students appeared to have done significantly better on these two tests.

The lack of significance of difference between the two groups in the results on the Test of Economic Understanding, Form B, warranted acceptance of the null hypothesis (H_{02}) that there is no significant difference in student achievement on tests of economic understanding between students who have studied under the project method of instruction and

Table 26. Means, Adjusted Means, and F Results for the Eleventh-Grade Group for the Three Criterion Instruments

Test	Group	Raw Means	Adjusted Means	F	Sig.
Sales Aptitude	1	13.56	-.173	.041	NS
Sales Aptitude	2	13.46	.173		
Sales Terms	1	20.35	-.675	3.055	NS
Sales Terms	2	22.42	.675		
Economics, B	1	17.66	-.140	.188	NS
Economics, B	2	19.12	.140		

* Significance at the .05 confidence level = 3.24.

Table 27. Means, Adjusted Means, and F Results for the Twelfth-Grade Group for the Three Criterion Instruments

Test	Group	Raw Means	Adjusted Means	F	Sig.
Sales Aptitude	3	17.52	-1.364	2.679	NS
Sales Aptitude	4	20.82	1.364		
Sales Terms	3	22.59	- .712	1.674	NS
Sales Terms	4	24.39	.712		
Economics, B	3	18.09	- .067	.024	NS
Economics, B	4	21.72	.067		

* Significance at the .05 confidence level = 3.24.

Table 28. Means, Adjusted Means, and F Results for the Project Method and Cooperative Method Groups for the Three Criterion Instruments

Test	Group	Raw Means	Adjusted Means	F	Sig.
Sales Aptitude	1	13.56	-2.607	9.045	*
Sales Aptitude	3	17.52	2.607		
Sales Terms	1	20.35	- .872	4.601	*
Sales Terms	3	22.59	.872		
Economics B	1	17.66	- .290	1.592	NS
Economics B	3	18.09	.290		

* Significance at the .05 confidence level = 3.24.

students who have studied under the cooperative method of instruction in distributive education.

The significant difference between the two groups in the results on the Test of Sales Aptitude and The Sales Terms Test warranted rejection of the null hypothesis (H_{01}) that there is no significant difference in student achievement on tests of sales comprehension between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education.

Summary of the Stated Hypotheses

The null hypotheses under test were:

H_{01} : that there is no significant difference in student achievement on tests of sales comprehension

between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education.

The null hypothesis was rejected on the basis of the significance of difference in the scores of the project method and the cooperative method groups on the two tests measuring sales comprehension. The cooperative method group scored significantly higher than the project method students on both tests measuring the sales competency.

Ho₂: that there is no significant difference in student achievement on tests of economic understanding between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education.

The null hypothesis was accepted on the basis of the lack of significance of difference in the scores of the project method and the cooperative method groups on the Test of Economic Understanding, Form B.

Ho₃: that prior achievement, as inferred from scores on the STEP-Reading, Form 2A, is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

The null hypothesis was accepted on the basis of the lack of significance of difference in prior achievement (reading ability) between the project and cooperative method groups, resulting in the inability to use prior achievement in assessing the effectiveness of each of the two methods of instruction.

Ho₄: that socio-economic status is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

The null hypothesis was accepted on the basis of the low and sporadic correlations between the socio-economic indices and the scores on the five standardized tests.

Ho₅: that students' age is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

The null hypothesis was accepted on the basis of the slight differences between the mean ages for the groups and the lack of correlation between students' age and scores on the five standardized tests.

Ho₆: that sex of students is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

The null hypothesis was accepted on the basis of the sporadic significance between means on test scores and the lack of correlation between sex of students and scores in the five standardized tests.

Ho₇: that teacher attitude, as measured by a teacher attitude inventory, is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension.

The null hypothesis was accepted on the basis of the low correlations between teacher attitude inventory scores and student scores on the five standardized tests.

CHAPTER V

SUMMARY OF MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to review briefly the nature and conduct of the study, present a recapitulation of the significant findings, and make certain conclusions and recommendations on the basis of these findings.

The Study and Its Design

Recent federal legislation has focused attention upon the project method of instruction as a vehicle for providing in-school preparatory distributive education. The U. S. Office of Education has endorsed the project method of instruction as a teaching device which seeks the same learning outcomes as the cooperative method of instruction. Evaluation of the effectiveness of an innovation in the methods of teaching and organizing distributive education programs is necessary before widespread acceptance is feasible. This initial study was conducted to compare and describe the project and the cooperative methods of teaching distributive education. With the present growth and expansion of distributive education programs in high schools throughout the country, there is now a need to evaluate both methods of instruction in light of growing demands upon them in distributive education.

The Problem

It was the purpose of this study to make a descriptive analysis and comparison of eleventh-grade distributive education students who received instruction through the project method to twelfth-grade distributive education students who received instruction through the cooperative method. More specifically, the study was concerned with (H_{01}) the significance of the difference in student achievement on tests of sales comprehension between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education; (H_{02}) the significance of the difference in student achievement on tests of economic understanding between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education; (H_{03}) the relationship of students' prior achievement, as measured by a test of reading comprehension, and achievement on tests of sales comprehension and economic understanding; (H_{04}) the relationship of students' socioeconomic status and achievement on tests of economic understanding and sales comprehension; (H_{05}) the relationship of students' age and achievement on tests of economic understanding and sales comprehension; (H_{06}) the relationship of sex of students and achievement on tests of economic understanding and sales comprehension; and (H_{07}) the relationship

of teacher attitude and students' achievement on tests of economic understanding and sales comprehension.

Procedures of the Study

This section is presented in four parts for the purpose of simplification and clarity: (1) nature of the instruction, (2) data collection, (3) data processing, and (4) procedures of analysis.

Nature of the Instruction: The ten public high schools included in the study were part of the distributive education curriculum development project of the Michigan State University Research and Development Program in Vocational-Technical Education. Each school had a single-period eleventh-grade distributive education project method class and a single-period twelfth-grade distributive education cooperative method class. Also in each school, an eleventh-grade English or social science class and a twelfth-grade English or social science class were used as control groups. The curriculum for the project method classes included content material integrated with individually and group designed projects. During the testing period, September 1966 to January 1967, the units of study dealt with employment orientation, self improvement, and the sales process.

The twelfth-grade cooperative method classes were taught in the traditional manner, relating classroom instruction with the students' occupational experience.

Data Collection: The data used in the study was gathered from the ten public high schools. In each school, the same teacher taught both the eleventh-grade project method class and the twelfth-grade cooperative method class. Data were also collected on one eleventh-grade and one twelfth-grade English or social science class in each of the ten schools. These were control classes. In the study, the eleventh-grade project method classes were labeled group one; the eleventh-grade control classes, group two; the twelfth-grade cooperative method classes, group three; and the twelfth-grade control classes, group four. Information was gathered on all students (733) in the following five areas: (1) socio-economic information (Messier Index and Duncan Index); (2) student prior achievement (scores on STEP-Reading, Form 2A); (3) scores on tests of economic understanding (pre and post) and sales comprehension; (4) data on students in regard to age, sex, prior courses in economics and sales, and father's occupation; and (5) data on teachers in regard to age, educational background, teaching experience and scores on a teacher attitude inventory.

Data Processing: Punched cards were prepared for each student, with the following data: school; group; age; STEP-Reading score; Test of Economic Understanding, Form A, score; Test of Economic Understanding, Form B, score; Test of Sales Aptitude score; Sales Terms Test score; the Duncan Index; if student had had a prior course in economics; if

student had had a prior course in sales; the school's socio-economic index, the school's racial-ethnic intermix index, the school's occupations index (these last three represent the Messier Index); and the teacher's MTAI score.

Procedures of Analysis: Three statistical procedures were used in the analysis of the total data: simple correlations, t-tests, and analyses of covariance. Simple correlations were computed between the several variables in several combinations of groups: the total groups, each group independently, the total eleventh-grade groups, the total twelfth-grade groups, groups one and three, and groups two and four. Where applicable t-tests were computed to determine the extent of significance. Analyses of covariance were performed with respect to the scores in the Test of Economic Understanding, Form B, the Test of Sales Aptitude, and the Sales Terms Test, using the scores on the STEP-Reading and the Test of Economic Understanding, Form A, as covariates. Group means were the units of analysis in all of the analyses. Hypotheses were accepted or rejected on the basis of the .05 level of confidence.

Summary of Major Findings

1. There was no statistically significant correlation between the variables of students' socio-economic status, students' age, students' sex, and teachers' attitude inventory scores and the scores students attain on standardized

achievement tests measuring reading comprehension, economic understanding, and sales comprehension.

The null hypothesis H_{04} that socio-economic status is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension, was accepted. The simple correlations indicated low and sporadic correlations between the Messier Index and the Duncan Index and the students' scores on the several achievement tests.

The null hypothesis H_{05} that students' age is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension, was accepted. The simple correlations indicated a lack of correlation between students' age and scores on the achievement tests.

The null hypothesis H_{06} that sex of students is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension, was accepted. The simple correlations showed a lack of correlation between students' sex and test scores, and the t-tests computed revealed only intermittent significance.

The null hypothesis H_{07} that teacher attitude is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test

scores in economic understanding and sales comprehension, was accepted. The simple correlations revealed low correlations between the teachers' MTAI scores and students' scores on the standardized tests.

2. There was a positive correlation between student prior achievement, as inferred from test scores achieved on the STEP-Reading, and scores students attain on standardized achievement tests of economic understanding and sales comprehension.

Use of a reading comprehension test was considered to be an adequate means of measuring students' prior achievement level. Results of the analyses indicated that students who scored high on the STEP-Reading performed equally well on the other standardized tests. On the whole, the students in the two control groups scored higher than the distributive education students on the reading comprehension test. There were high correlations between the STEP-Reading scores and the other standardized test scores. The t-tests performed also revealed a high level of correlation. Also, when the analyses of covariance were computed, the STEP-Reading scores again were significantly correlated to several of the other test scores. However, the scores on the STEP-Reading were not significantly different for the project method and the cooperative method groups.

Therefore, the null hypothesis H_{03} that prior achievement, as inferred from scores in the STEP-Reading, Form 2A,

is of no significance in assessing the effect of each of the two methods of instruction, as measured by standardized test scores in economic understanding and sales comprehension, had to be accepted.

3. The results showed that the two control groups (English and/or social science classes), on the whole performed as well as or, in some cases, better than the two distributive education groups on the tests of economic understanding and sales comprehension. However, after initial differences were adjusted for through the analyses of covariance, the differences in the scores of the two grade-level control groups and their respective distributive education groups were not significant.

4. The differences in the scores of the cooperative method classes and the project method classes on the tests of sales comprehension were significant. There was no significant difference between the scores of these two groups on the test of economic understanding. On the whole, the cooperative method classes scored higher on all the tests, though only significantly higher on the tests of sales comprehension.

The null hypothesis H_{01} that there is no significant difference in student achievement on tests of sales comprehension between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education was rejected.

The null hypothesis H_{02} that there is no significant difference in student achievement on tests of economic understanding between students who have studied under the project method of instruction and students who have studied under the cooperative method of instruction in distributive education was accepted.

Conclusions

The following conclusions are drawn from the findings of this study. These conclusions are pertinent to and limited by the assumptions and design of the study. Any conclusions based upon the results of the study are tentative and in need of further substantiating research.

1. Certainly, because of the lack of significant differences in scores between the control classes and the distributive education classes, one cannot conclude here that non-distributive education students and distributive education students are being taught and are learning the same concepts of economic understanding and sales comprehension. It can perhaps be concluded that the standardized tests utilized in this study were so general in nature of content that the specialized content of the distributive education curriculum was not effectively measured by these tests.

It may also be concluded from this study that the competencies and objectives in distributive education cannot now be easily measured because they have not yet been accurately and adequately defined.

2. The results and the design of this study led the researcher to conclude that the cooperative method group, on the whole, performs somewhat better than the project method group.

Perhaps, again, it may be said that the standardized tests of economic understanding and sales comprehension, because of their generalized content, were not sufficiently sophisticated instruments to measure effectively the difference between these two groups, and, therefore, the two methods of instruction. The cooperative method students have additional experiences in their on-the-job activities; the project method students have various and different experiences in the projects they complete. It is plausible that these tests do not measure differences in the amount and kind of learning such differing experiences bring about.

The teachers themselves may have been a contributory factor in the difficulty in assessing the effectiveness of the two methods of instruction. All ten had had no previous experience in teaching by the project method. These ten teachers did have available to them a wide variety of materials, teaching aids, assistance, and teacher training for use with their project method classes. It is conceivable that this attention and assistance caused these teachers to be not only effective project method teachers but also teachers who unconsciously incorporated some of these methods and materials into their cooperative method classes.

This would obviously result in a lessening of measurable differences between the two groups.

Any new method of instruction or any innovation in education needs a period of time to take hold. It may also be concluded in this study that the teachers had not had sufficient time and experience to become completely familiar with their materials and with the project method of instruction, prior to the period in which their students were being evaluated.

3. It may be concluded from the results of this study that students who enroll in a distributive education program are not so academically talented as non-distributive education students.

4. It may be concluded that in programing students for distributive education classes, the factors of age, sex, and socio-economic background should be of little or no consideration.

5. The design of the study did not include selection procedures for including or excluding students from either the project method or the cooperative method classes. Perhaps, then, there were some unknown variables operating in the population of the study which may have caused a nullifying effect, rendering conclusive analysis of the effectiveness of methods of instruction difficult.

Recommendations

In view of the findings and conclusions of this study, the following recommendations are made. It is suggested that the study be replicated with several changes and additions:

1. Of primary importance is the development and use of instruments which effectively measure the outcomes expected for distributive education classes.

2. Students should be selected for inclusion in the project method class on the basis of results of tests and inventories which measure attitude, interests, personality, and prior achievement. Information of this kind should be collected on all students included in the study for the purpose of determining the effect on individuals of each of the methods of instruction. Also, this information would permit the use of the paired-comparisons technique of analysis.

3. A variety of measurements need to be made on all students in the study. In addition to paper-and-pencil tests which measure knowledge in one or all of the competencies, students' attitudes and reactions should be measured in a pre- and post-test situation. General measures of ability and prior achievement might also prove helpful (e.g., grades, intelligence tests).

4. There should be included in the study teachers who teach both the project method and cooperative method classes,

teachers who teach only the project method classes, and teachers who teach only the cooperative method classes. It is suggested, also, that some project method classes and cooperative method classes be in different schools.

5. Built into the study, there should be provision for a longer period of evaluation and follow-up studies. Testing of students in the study should take place periodically during an entire school year, and these students should also be evaluated during the next school year, in class or on the job.

The conclusions and recommendations also point out several areas for other kinds of research.

1. There is an imperative need for the development and validation of adequate instruments to measure outcomes in distributive education.

2. There is a need for distributive education to define through research the competencies basic to distributive education in behavioral terms so that outcomes in distributive education may be more accurately measured.

3. Future designs of studies of the effectiveness of the project method and cooperative method of instruction should include several different class arrangements. Comparisons and studies should be made of eleventh-grade project method classes with eleventh-grade traditional (non-project method, non-cooperative method) distributive education classes; twelfth-grade cooperative distributive education

students who have had the eleventh-grade project method class with the twelfth-grade cooperative method distributive education students who have had the traditional eleventh-grade distributive education class.

Research is also needed to examine other plans of distributive education project method teaching, such as a double-period class in which the second period is a project-laboratory experience.

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APPENDIX A

**DOCUMENTS RELATING TO ESTABLISHMENT
OF THE DISTRIBUTIVE EDUCATION
CURRICULUM DEVELOPMENT PROJECT**

APPENDIX A.1

MICHIGAN STATE UNIVERSITY - EAST LANSING

COLLEGE OF EDUCATION - DEPARTMENT OF SECONDARY EDUCATION
AND CURRICULUM
315 Erickson Hall

December 17, 1965

Dear Mr.

The recent American Vocational Association conference in Miami, Florida, pointed up many changes that are taking place in the future programs of education for distribution. Michigan State University under a USOE Research and Development Project in Vocational/Technical Education (ERD 261-65) will develop a series of pilot demonstration programs in distributive education using the "project" method of instruction.

The project statement of problem is as follows: To establish a series of pilot programs in distributive education organized according to a project plan in order to test the hypotheses that: in-school preparatory work environment to prepare students for occupational objectives, can produce outcomes comparable, in student achievement, personality growth, and job success, to those now being gained through the cooperative method of instruction in the traditional distributive education program.

Interested vocational directors, administrators, and other supervisory personnel are invited to attend an orientation session at the MSU campus on Wednesday, January 12, 1966, from 1 to 4 p.m. The meeting will be held in Room 33 of the Union Building.

December 17, 1965

At this meeting the project will be outlined in detail in order for you to determine whether your school would be interested in this curriculum improvement program as a pilot demonstration school or an associate demonstration school. The responsibilities of the sponsoring institution and the participating school districts will be discussed. Schools now having a cooperative distributive education program, as well as those who are not involved in a program of distributive education, are eligible for participation.

Sincerely yours,

Peter G. Haines, Director
Research and Development Program
in Vocational-Technical Education

Edward T. Ferguson, Jr.
Distributive Education Pilot
Project Leader

p1

APPENDIX A.2

DISTRIBUTIVE EDUCATION

Pilot Program

Name of School _____

Address _____
Street City or Town County

Size of School (s) _____

Name of Vocational Director _____

1. Is there interest in Pilot Program participation?

Yes _____ No _____

2. Is there at present a cooperative distributive education program operating in your school district?

Yes _____ No _____ How Many _____

3. Name of DE teacher _____

Number of years teaching experience __ Certificate Held _____

Number of years of occupational experience _____

4. Does your school district have a qualified teacher who could teach in the pilot program?

Yes _____ No _____ Name _____

5. Does your school district have distributive education laboratory facilities?

Yes _____ No _____

APPENDIX A.3

MICHIGAN STATE UNIVERSITY EAST LANSING • MICHIGAN 48823

COLLEGE OF EDUCATION • DEPARTMENT OF SECONDARY EDUCATION AND CURRICULUM
RESEARCH AND DEVELOPMENT PROGRAM IN VOCATIONAL-TECHNICAL EDUCATION • ERICKSON HALL

February 11, 1966

To: Michigan Superintendents of Schools
From: Edward T. Ferguson, Jr., Project Leader
Re: Pilot Programs in Distributive Education

The recent American Vocational Association conference in Miami, Florida, pointed up many changes that are taking place in the future programs of education for distribution and marketing. Michigan State University under a USOE Research and Development Project in Vocational-Technical Education (ERD 261-65) will develop a series of pilot demonstration programs in distributive education using the "project" method of instruction.

The project statement of problem is as follows: To establish a series of twenty programs in distributive education organized according to the project plan in order to test the hypotheses that: in-school preparatory work environment to prepare students for occupational objectives can produce outcomes comparable, in student achievement, personality growth, and job success, to those now being gained through the cooperative method of instruction in the traditional distributive education program.

At a recent meeting in Lansing, vocational directors from the State of Michigan were brought together to discuss this research project. Forty school districts have shown interest in participating in this research venture.

If your school district was not represented at this meeting, and there is interest on the part of your district, please contact me within the near future. Final selection of the twenty pilot schools and twenty associate schools will be made by March 15.

A prospectus of the pilot program is enclosed for your convenience.

I may be reached by telephone at 355-1773, East Lansing.

Sincerely yours,

ETF
Enclosure

APPENDIX A.4

**RESEARCH AND DEVELOPMENT PROGRAM
IN VOCATIONAL-TECHNICAL EDUCATION**

Michigan State University, 310 Erickson Hall

MEMORANDUM OF AGREEMENT

The Research and Development Program in Vocational-Technical Education at Michigan State University and the _____ School District, City of _____, State of _____ agree in principle via this memorandum to conducting a research program in vocational education. This agreement is one of cooperative intent to work for the improvement of vocational education, rather than a legal contract.

The research activity to which this memorandum pertains is mainly supported by a grant from the United States Office of Education to Michigan State University under contract #OE-5-85-111.

Both Michigan State University and the _____ School District agree to carry out the research and development effort beginning _____ 1966 and continue at least through _____, depending on United States Office of Education continuation of fund support. The personnel at Michigan State University and at _____ School District recognize that each should be free to suggest modification of this research and development program at any time and that either may withdraw at any time. In such event the school district agrees to repay the pro-rata share of funds paid.

The specifications of this research and development endeavor are shown on the attachment.

Considerations of this agreement include:

1. All research data and reports are confidential and the property of the United States Office of Education until formally released by the M. S. U. Project Director in conformity with the terms of the U.S.O.E. contract.
2. Pilot schools and state departments involved in this research and development program are considered for payment purposes as providing consultant services.

Subject to U.S.O.E. approval, payments will be made by purchase order directly to schools involved.

/s/ _____	/s/ _____
Peter G. Haines, Director Research and Development Program in Vocational- Technical Education Michigan State University	Superintendent or Authorized Representative School _____ City _____ State _____

- provide for standardized testing of students in the pilot program, control group and cooperative program (if one exists in the school) at the start, middle and the end of the school year.
- provide usual instructional materials such as textbooks, reference books and materials, and audio-visual materials.
- provide M.S.U. research staff with opportunity for observation of the pilot program.
- provide for adequate room space and for distributive education laboratory facilities, furniture and fixtures.
- provide for follow-up of pilot demonstration class and cooperative class (where existing) on a one year, two year, three year and five year basis.

Financial Considerations

M.S.U. will provide funds to the local district equivalent to: the cost of 50% of the pilot teacher's planning period based on the number of class periods in the school day. Each M.S.U. contribution will be paid in installments on November 30, 1966, March 31, 1967, and June 20, 1967.

Local School Contact Person--regarding administration of pilot program

_____ Address _____
_____ Phone _____

Classroom teacher of pilot program _____
Address _____ Phone _____

Michigan State University Project Leader:

Mr. Edward T. Ferguson
315 Erickson Hall
Michigan State University
East Lansing, Michigan
Phone: 355-1773

Distributive Education Pilot Program

Description of Program:

To establish a pilot program in distributive education at _____ school district, city of _____ Michigan, organized according to a "project method" in order to test the hypothesis that: in school preparatory instruction utilizing the project method of instruction to assimilate the work environment to prepare students for occupational objectives, can produce outcomes comparable in student achievement, and job success, to those now being gained through the cooperative method of instruction in the traditional distributive education program.

Responsibilities of Michigan State University

- provide experimental teaching materials, aids, course outlines, curriculum guides, and teacher manual.
- provide consultant time of M.S.U. research staff for visitation at participating school and for teacher education conferences and workshops. (Five visitations to each school; two week workshop; seven one day workshops.)
- provide a two week summer workshop and seven one day workshops during the school year. Room, board, tuition, travel, books and materials to be provided by Michigan State University.
- reimburse 50% of the period of teacher time daily devoted to evaluation and research (approximately $2\frac{1}{2}$ hours per week).
- provide follow-up instruments for the one year, two year, three year, and five year follow-up of graduates of pilot and cooperative program students.
- provide standardized testing instruments and computer scoring for project method class, cooperative method class and control class.

Responsibilities of Local School District

- initiate and operate program according to pilot plan specifications.
- provide 7 days released time, including substitute's salary, for teacher to attend workshops during the school year.

- send teacher to a two week summer workshop at M.S.U. during August, 1966.
- provide period daily for teacher preparation and program evaluation of pilot project and submit monthly reports on progress of pilot program to project leader. (Planning time approximately 2 $\frac{1}{2}$ hours per week.)

APPENDIX B

**DOCUMENTS USED TO SECURE
DATA FROM POPULATION**

APPENDIX B.1

DISTRIBUTIVE EDUCATION PILOT PROJECT
MICHIGAN STATE UNIVERSITY
STUDENT PERSONNEL INDEX

Please indicate the percentage of parents of students that have the following circumstances.

PERCENTAGE IN
THIS SCHOOL

A. Area live in:

1. Select residential area (or areas) of highest repute in the community (homes over \$35,000) _____
2. Better suburban and apartment house area; homes with large grounds (over $\frac{1}{2}$ acre, homes \$25-35,000) _____
3. Preferred residential areas, adequate grounds, good apartment buildings (homes \$15,000-25,000) _____
4. Residential neighborhoods with no deterioration, reputed to be average (homes \$10,000-15,000) _____
5. Area beginning to deteriorate; business or industry entering into it (homes \$10,000-Under) _____
6. Area considerably deteriorated but not a slum area; depreciated reputation. _____
7. Slum area (or areas) of the community neighborhood in bad repute. _____

B. House type:

1. Large houses in good condition; adequate grounds (estate type; more than 12 rooms) _____
2. Large house in medium condition; large apartments in well-kept buildings (8-12 rooms) _____

PERCENTAGE

3. Moderate house in medium condition; large apartments in well-kept buildings (6-8 rooms) _____
4. Large house and moderate house in fair condition; apartment buildings in medium condition (6-8 rooms) _____
5. Small house in good condition; good apartments in remodelled houses (4-5 rooms) _____
6. Small house in medium condition or fair condition; apartments in fair condition (4-5 rooms) _____
7. All houses and apartments in bad condition; store fronts, etc. _____

C. Source of income:

1. Savings and investments, inherited--50% or more of the income. _____
2. Savings and investments, gained by the earner--not retirement pensions. _____
3. Profits and fees--including higher executives who share in profits. _____
4. Salary or commission--including retirement earned thereby. _____
5. Wages, based upon hourly rates on piece-work. (Time Card Personnel.) _____
6. Private aid or assistance--may be supplemented by part-time work. _____
7. Public relief and non-respectable income, according to reputation. _____

D. Education:

1. Completed one or more years of graduate work at college or university. _____
2. Graduated from four-year college, university, etc. or professional school. _____

PERCENTAGE

3. Attended college for two or more years, or equivalent higher education. _____
4. Graduated from high school, or equivalent secondary education. _____
5. Attended high school, completed at least one year but did not graduate. _____
6. Completed no more than three to eight years of grade school. _____
7. Completed no more than three years of grade school. _____

E. Racial Background:

1. Old American or Old established community names. _____
2. Assimilated American or community leader, etc., but not of "old names." _____
3. French Canadian or Irish. _____
4. Northern European ethnic group or sect. _____
5. Southern European or Jewish. _____
6. Eastern European or Near East. _____
7. Colored--Negro, Oriental. _____

F. Occupations:

1. Lawyer, doctor, dentist, judge, minister, professor, engineer, or comparable occupations. _____
2. High school teacher, trained nurse (RN), chiropodist, chiropractor, architect, undertaker, minister (no college), asst. office and dept. managers or supervisors, real estate salesmen in reputed firms, columnist or editorial writers, accountant, etc. _____

	<u>PERCENTAGE</u>
3. Grade school teacher, optometrist, pharmacist (employee), mgrs. of small branch stores and similar businesses, salesmen, buyers, bank and broker's clerks, RR agent, elected civic and county officials, newspaper reporter, etc.	_____
4. Stenographer, bookkeeper, rural mail clerk, ticket agent, auto salesmen, auto, clothing, book, drygoods, salesmen, etc.	_____
5. Drugstore, hardware, grocery, dime store clerks, telephone or beauty operators, dressmaker, practical nurse, etc.	_____
6. Gentlemen farmers, large landowners and operators who patronize the local activities.	_____
7. Managers and land operators with active urban life.	_____
8. Small contractor who works at or superintends his jobs; commercial pilot; owners and operators of good mechanized farms.	_____
9. Factory or mine foreman; carpenter, electrician, plumber, welder, master mech., RR engineer and trainmen, linotype operator, printer, police captain, butcher, tailor, dry cleaner, small landowners and the "forgotten farmer" who owns a "decent" place, etc.	_____
10. Apprentice to skilled trades; time-keeper, RR firemen and brakeman, tel and tel-lineman, medium-skilled factory worker, policeman, barber, gas station operators, bartender, liquor salesman, head waiter, tenants on good farms, owners of farms who just manage to make a living, etc.	_____
11. Semi-skilled factory and production workers, warehouseman, janitor, watchman, cook, taxi and truck drivers, baggageman, delivery man, gas station attendant, waiter or waitress, etc.	_____

	<u>PERCENTAGE</u>
12. Laborer, miner, mill hand, migrant worker, section hand, scrub woman, laundress, domestic servant, bus boy, etc.	
13. Reputed lawbreakers, etc.	

APPENDIX B.2

MICHIGAN STATE UNIVERSITY
RESEARCH AND DEVELOPMENT PROJECT

DATA SHEET

Name _____ Date _____
last first initial month day year
Age _____ Date of Birth _____ Sex M F
month day year (circle one)

School _____

Instructor _____ Grade _____ Course _____

Father's Occupation _____

Have you had a course in Economics? Yes _____ No _____ In process _____
(check one)

Have you had a course in sales, retailing, or distributive
education prior to the one you are taking now? Yes _____ No _____
(check one)

APPENDIX B.3

DISTRIBUTIVE EDUCATION
PILOT PROJECTGENERAL INFORMATION

Name (Please Print) _____
Last First

1. How many years of teaching experiences have you had?
(check one)
less than 1 ____ 1 ____ 2 ____ 4 ____ 5-9 ____ 10-15 ____ 16-20 ____
21 or more ____
2. What is your age? (check one) 20-24 ____ 25-29 ____ 30-34 ____
35-39 ____ 40-44 ____ 45-49 ____ 50-59 ____ 60 or more ____.
3. A. What is your sex? Male ____ Female ____
B. Are you married? Yes ____ No ____
4. How many years have you been employed on this high school staff?
less than 1 ____ 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6-9 ____ 10-15 ____
16-20 ____ 21 or more ____
5. What is the highest academic degree that you hold?
Bachelors ____ Masters ____ Doctorate ____ Others (specify) ____
6. How many hours of credit (indicate quarter or semester) do you have
a) beyond Bachelors, but less than Masters ____
b) beyond Masters ____
7. What is your father's occupation? (If deceased, what was it? Please be precise.)

8. Give the name of your school and the total enrollment of grades 10-12:

APPENDIX C

DOCUMENTS USED TO MEASURE ACHIEVEMENT AND ANALYZE DATA

APPENDIX C.1

**TEST OF
ECONOMIC UNDERSTANDING
Form A**

1. Every economic system faces the need to economize. In this context, which of the following is the best definition of "to economize"?
 - A. To save money and thus reduce the national debt
 - B. To dispense with the production of luxuries
 - C. To balance the government's budget by reducing spending
 - D. To make the best use of scarce resources that have alternative uses

2. What is meant by the assertion that every economic system (such as socialism, capitalism, communism) faces the fact of scarcity?
 - A. There are insufficient productive resources to satisfy all wants of a society.
 - B. There are times when some products can be had only by paying high prices.
 - C. In the beginning every society faces shortages, but a mature economy, such as our own, overcomes scarcity in time.
 - D. All economies have depressions during which scarcities exist.

3. Which of the following best characterizes the relation between producers, consumers, and government in a private enterprise economy?
 - A. Producers decide what to produce, government how it shall be produced, and consumers who shall receive the product.
 - B. Consumer spending leads producers to decide what shall be produced and how resources shall be used. Government seeks to maintain competition and the rights of private property.
 - C. Consumers decide what should be produced, producers how best to produce it, and government who shall receive which products.
 - D. Government ultimately decides what shall be produced and how. Consumers and producers, as voters, control the government.

4. Three of the following are essential to the operation of a private enterprise economy. Which one **might** such an economy operate without?
 - A. Profit motive
 - B. Markets
 - C. Corporations
 - D. Prices

5. Of the following, the principle of diminishing returns is best illustrated by
 - A. small firms being driven out of business by large firms
 - B. any decline in the average rate of profits
 - C. a slowing rate of increase in output as a farmer adds increasing amounts of fertilizer to his land
 - D. the decline in personal income as workers age

APPENDIX C.2

(Test of Sales Aptitude)

4. A woman has requested a radiator cover firm to send one of their salesmen. Upon his arrival she says she has changed her mind. What is the best thing for the salesman to do?
 - ___ Politely explain that she is obligated to see the samples.
 - ___ Ask her, "Have you purchased some already?"
 - ___ Tell her she is making a serious mistake.
 - ___ Say to her, "As long as I am here, I may as well show you the samples."
5. A job lot dealer has bought up a large number of second hand cameras. He wishes to get rid of them quickly but at a decent profit. Which one of the following groups will probably be the best market?
 - ___ camera shops selling second hand equipment
 - ___ schools offering art courses
 - ___ newspaper photography departments
 - ___ student camera clubs
6. Which one of the following items sells better in rural districts than in cities?
 - ___ overalls
 - ___ sporting goods
 - ___ books on animal husbandry
 - ___ building materials
7. A prospective customer comes to the stationery department of a store in search of desk accessories advertised in newspapers. After seeing the items as well as others not advertised, the man leaves without having purchased anything. What is the most probable reason for this?
 - ___ the salesman failed to make the items appear as attractive as the ad presented them
 - ___ the items were poorly displayed, making them unattractive
 - ___ the potential customer could not make up his mind as to just what he wanted
 - ___ he was not asked by the salesman to make a purchase
8. The best thing for a hardware store salesman to do when a prospective customer indicates that he has not decided what to buy is to
 - ___ follow him about, pointing out the merits of each item
 - ___ bring to his attention the most needed carpenter's tools
 - ___ stick close by, being ready to offer assistance in purchases
 - ___ show him a sample of the sale of the day
9. Most of the salesmen of a particular soap company are doing better than ever before but George is doing worse. He could probably improve MOST by
 - ___ finding out more about the product he is selling
 - ___ requesting a change in territory
 - ___ developing pleasant personality traits
 - ___ studying the methods of successful salesmen
10. In selling baby carriages to dealers, it would be best to emphasize which one of the following points?
 - ___ all metal parts are chrome plated to resist rust
 - ___ only our carriages have the new "knee action" feature
 - ___ more of these carriages have been sold in the past year than any other make
 - ___ our company has spent \$100,000 advertising this model
11. In a large city a telephone directory would be most helpful in selecting prospective buyers of which one of the following items?
 - ___ electric refrigerators
 - ___ automobiles
 - ___ magazine subscriptions
 - ___ vacuum cleaners
12. The same book would sell best under which one of the following titles?
 - ___ "Sing for Your Supper"
 - ___ "How to Sing for Money"
 - ___ "Dollar Serenade"
 - ___ "Manual of Voice Training"
13. Which one of the following leads will best serve to start a sales interview?
 - ___ "If I could show you how to save enough money to buy a new factory, would you be interested?"
 - ___ "Would you be interested in something new in labor saving machinery?"
 - ___ "I have an item here that everyone is interested in."
 - ___ "This plan I have here will cut your overhead 25%."
14. A man enters a clothing store accompanied by his wife. He has tried on a suit that he likes. To help complete the sale, the salesman's best move is to
 - ___ assure the man that the suit looks good on him
 - ___ point out to the wife that the suit will wear well and is the latest model
 - ___ try to convince the couple that this is a very good buy considering the poor materials generally available
 - ___ mention the fact that this particular model has been selling better than any other
15. Which one of the following will best serve to improve a salesman's business?
 - ___ invite prospective customers to dinner
 - ___ read recent publications relating to his field
 - ___ take courses in psychology
 - ___ read up on economic theories
16. "Staple" and "specialty" refer to
 - ___ materials sold in the hardware and tool business
 - ___ styles of approach in selling
 - ___ necessities and luxuries
 - ___ an item that has a dual purpose and is therefore a good buy
17. During the discussion between a company's buyer and a salesman, the buyer has to leave to meet a scheduled appointment. In this instance, which one of the following should the salesman do?
 - ___ tell the buyer he will wait for him to return
 - ___ leave and call later for an appointment
 - ___ ask to go along with the buyer so as to continue the talk
 - ___ request another interview
18. In trying to persuade a client to increase the fire insurance on his home which one of the following sales demonstrations would serve best?
 - ___ show him that fire insurance today is cheaper than it ever was before
 - ___ point out that his insurance does not cover the present value of the house
 - ___ point out that millions of dollars were collected last year by fire victims
 - ___ point out similar homes in the neighborhood that are insured for more
19. Which one of the following is "capital goods"?
 - ___ saving bonds
 - ___ sewing machines
 - ___ unbleached muslin
 - ___ any item whose price is regulated by the federal government
20. A salesman is told by an old account that he is too busy to see him that day. In such an instance the best thing for the salesman to do is
 - ___ tell him his order will only take a short time to place
 - ___ mention the company's special sale
 - ___ tell him he will call later in the week for an appointment
 - ___ ask the secretary to telephone him when the boss is not busy

APPENDIX C.3

(Test of Sales Terms)

CONTRACT means the same as:

Area to which salesman is assigned.

He paid on the installment plan.

(the underlined word means the same as)

PURCHASE means the opposite of:

Sale of goods in large quantity.

Orders are backlogged for this product.

COMMODITY means the same as:

Payment made when goods delivered.

We underwrite the machine for one year.

1	2	3	4	
policy	connection	agreement	option	☐
distribution	market	coverage	territory	☐
on time	in full	by check	in advance	☐
client	sale	buy	commerce	☐
retail	mail order	wholesale	manufacture	☐
slack	cancelled	fluctuating	unfilled	☐
service	consumer	merchandise	market	☐
C.O.D.	store-door	charge	cash sale	☐
put on trial	guarantee	lease	service	☐

COMPETITOR means the opposite of:

To return money paid for goods.

A price quotation was furnished.

INVOICE means the same as:

Annual account of goods.

He was an accredited agent.

CONFIRMATION means the opposite of:

People to whom product is sold.

It was a clearance sale.

1	2	3	4	
merchant	clientele	huckster	partner	☐
discount	rebate	concession	receipt	☐
tariff	account	valuation	concession	☐
bill	endorsement	receipt	account	☐
catalog	audit	ledger	inventory	☐
commissioned	abrogated	proxy	accessory	☐
requisition	cancellation	contract	affirmation	☐
volume	outlet	market	demand	☐
wholesale	bankruptcy	budget	liquidation	☐

ITEMIZE means the same as:

An investment policy of insurance.

He appraised the jewelry.

DIVERSIFICATION means the opposite of:

Estimated volume of sales.

The price was made retroactive.

CONTINGENT means the same as:

Retail association eliminating middleman.

The net profit was small.

1	2	3	4	
underline	add	invoice	detail	☐
endowment	floater	casualty	liability	☐
rebated	analyzed	set price	promoted	☐
innovation	permanence	variety	transference	☐
commission	budget	assessment	quota	☐
backward	reduced	transferred	subsequent	☐
confirmatory	contractual	conditional	consecutive	☐
concession	syndicate	cooperative	supermarket	☐
unit	clear	retail	gross	☐

GO AHEAD

APPENDIX C.4

DUNCAN INDEX

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
<u>Professional, technical, and kindred workers</u>	
Accountants and auditors	78
Actors and actresses	60
Airplane pilots and navigators	79
Architects	90
Artists and art teachers	67
Athletes	52
Authors	76
Chemists	79
Chiropractors	75
Clergymen	52
College presidents, professors, and instructors(n.e.c.)	84
Dancers and dancing teachers	45
Dentists	96
Designers	73
Dietitians and nutritionists	39
Draftsmen	67
Editors and reporters	82
Engineers, technical	85
Aeronautical	87
Chemical	90
Civil	84
Electrical	84
Industrial	86
Mechanical	82
Metallurgical and metallurgists	82
Mining	85
Not elsewhere classified	87
Entertainers (n.e.c.)	31
Farm and home management advisors	83
Foresters and conservationists	48
Funeral directors and embalmers	59
Lawyers and judges	93
Librarians	60
Musicians and music teachers	52
Natural scientists (n.e.c.)	80
Nurses, professional	46
Nurses, student professional	51
Optometrists	79
Osteopaths	96
Personnel and labor relations workers	84
Pharmacists	82
Photographers	50

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Physicians and surgeons	92
Radio operators	69
Recreation and group workers	67
Religious workers	56
Social and welfare workers, except group	64
Social scientists	81
Sports instructors and officials	64
Surveyors	48
Teachers (n.e.c.)	72
Technicians, medical and dental	48
Technicians, testing	53
Technicians (n.e.c.)	62
Therapists and healers (n.e.c.)	58
Veterinarians	78
Professional, technical, and kindred workers(n.e.c.)	65
 <u>Farmers and farm managers</u>	
Farmers (owners and tenants)	14
Farm managers	36
 <u>Managers, officials, and proprietors, exc. farm</u>	
Buyers and department heads, store	72
Buyers and shippers, farm products	33
Conductors, railroad	58
Credit men	74
Floormen and floor managers, store	50
Inspectors, public administration	63
Federal public administration and postal services	72
State public administration	54
Local public administration	56
Managers and superintendents, building	32
Officers, pilots, pursers, and engineers, ship	54
Officials & administrators (n.e.c.) public adminis- tration	66
Federal public administration and postal service	84
State public administration	66
Local public administration	54
Officials, lodge, society, union, etc.	58
Postmasters	60
Purchasing agents and buyers (n.e.c.)	77
Managers, officials, & proprietors (n.e.c.) - salaried	68
Construction	60
Manufacturing	79
Transportation	71
Telecommunications, & utilities & sanitary services	76
Wholesale trade	70
Retail trade	56
Food and dairy products stores, and milk retailing	50

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
General merchandise and five and ten cent stores	68
Apparel and accessories stores	69
Furniture, home furnishings, and equipment stores	68
Motor vehicles and accessories retailing	65
Gasoline service stations	31
Eating and drinking places	39
Hardware, farm implement, & bldg. material retail	64
Other retail trade	59
Banking and other finance	85
Insurance and real estate	84
Business services	60
Automobile repair services and garages	47
Miscellaneous repair services	53
Personal services	50
All other industries (incl. not reported)	62
Managers, officials, - propr's (n.e.c.)--self employed	48
Construction	51
Manufacturing	61
Transportation	43
Telecommunications, & utilities & sanitary services	44
Wholesale trade	59
Retail trade	43
Food and dairy products stores, and milk retailing	33
General merchandise and five and ten cent stores	47
Apparel and accessories stores	65
Furniture, home furnishings, and equipment stores	59
Motor vehicles and accessories retailing	70
Gasoline service stations	33
Eating and drinking places	37
Hardware, farm implement, & bldg. material retail	61
Other retail trade	49
Banking and other finance	85
Insurance and real estate	76
Business services	67
Automobile repair services and garages	36
Miscellaneous repair services	34
Personal services	41
All other industries (incl. not reported)	49
<u>Clerical and kindred workers</u>	
Agents (n.e.c.)	68
Attendants and assistants, library	44
Attendants, physician's and dentist's office	38
Baggagemen, transportation	25

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Bank tellers	52
Bookkeepers	51
Cashiers	44
Collectors, bill and account	39
Dispatchers and starters, vehicle	40
Express messengers and railway mail clerks	67
Mail carriers	53
Messengers and office boys	28
Office machine operators	45
Shipping and receiving clerks	22
Stenographers, typists, and secretaries	61
Telegraph messengers	22
Telegraph operators	47
Telephone operators	45
Ticket, station, and express agents	60
Clerical and kindred workers (n.e.c.)	44
<u>Sales workers</u>	
Advertising agents and salesmen	66
Auctioneers	40
Demonstrators	35
Hucksters and peddlers	8
Insurance agents and brokers	66
Newsboys	27
Real estate agents and brokers	62
Stock and bond salesmen	73
Salesmen and sales clerks (n.e.c.)	47
Manufacturing	65
Wholesale trade	61
Retail trade	39
Other industries (incl. not reported)	50
<u>Craftsmen, foremen, and kindred workers</u>	
Bakers	22
Blacksmiths	16
Boilermakers	33
Bookbinders	39
Brickmasons, stonemasons, and tile setters	27
Cabinetmakers	23
Carpenters	19
Cement and concrete finishers	19
Compositors and typesetters	52
Cranemen, derrickmen, and hoistmen	21
Decorators and window dressers	40
Electricians	44
Electrotypers and stereotypers	55
Engravers, except photoengravers	47
Excavating, grading, and road machinery operators	24

Occupations, by major occupation group	Socio-economic index
Foremen (n.e.c.)	49
Construction	40
Manufacturing	53
Metal industries	54
Machinery, including electrical	60
Transportation equipment	66
Other durable goods	41
Textiles, textile products, and apparel	39
Other nondurable goods (incl. not specified mfg.)	53
Railroads and railway express service	36
Transportation, except railroad	45
Telecommunications, & utilities & sanitary services	56
Other industries (incl. not reported)	44
Forgemen and hammermen	23
Furriers	39
Glaziers	26
Heat treaters, annealers, and temperers	22
Inspectors, scalers, and graders, log and lumber	23
Inspectors (n.e.c.)	41
Construction	46
Railroads and railway express service	41
Transport, exc. rr., communic'n, & other public util.	45
Other industries (incl. not reported)	38
Jewelers, watchmakers, goldsmiths, and silversmiths	36
Job setters, metal	28
Linemen and servicemen, telegraph, telephone, and power	49
Locomotive engineers	58
Locomotive firemen	45
Loom fixers	10
Machinists	33
Mechanics and repairmen	25
Airplane	48
Automobile	19
Office machine	36
Radio and television	36
Railroad and car shop	23
Not elsewhere classified	27
Millers, grain, flour, feed, etc.	19
Millwrights	31
Molders, metal	12
Motion picture projectionists	43
Opticians, and lens grinders and polishers	39
Painters, construction and maintenance	16
Paperhangers	10
Pattern and model makers, except paper	44
Photoengravers and lithographers	64
Piano and organ tuners and repairmen	38

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Plasterers	25
Plumbers and pipe fitters	34
Pressmen and plate printers, printing	49
Rollers and rool hands, metal	22
Roofers and slaters	15
Shoemakers and repairers, except factory	12
Stationary engineers	47
Stonecutters and stone carvers	25
Structural metal workers	34
Tailors and tailoresses	23
Tinssmiths, coppermiths, and sheet metal workers	33
Toolmaker, and die makers and setters	50
Upholsterers	22
Craftsmen and kindred workers (n.e.c.)	32
Members of the armed forces	18
<u>Operatives and kindred workers</u>	
Apprentices	35
Auto mechanics	25
Bricklayers and masons	32
Carpenters	31
Electricians	37
Machinists and toolmakers	41
Mechanics, except auto	34
Plumbers and pipe fitters	33
Building trades (n.e.c.)	29
Metal working trades (n.e.c.)	33
Printing trades	40
Other specified trades	31
Trade not specified	39
Asbestos and insulation workers	32
Attendants, auto service and parking	19
Blasters and powdermen	11
Boatmen, canalmen, and lock keepers	24
Brakemen, railroad	42
Bus drivers	24
Chainmen, rodmen, and asmen, surveying	25
Conductors, bus and street railway	30
Deliverymen and routemen	32
Dressmakers and seamstresses, except factory	23
Dyers	12
Filers, grinders, and polishers, metal	22
Fruit, nut, & vegetable graders & packers, exc. factory	10
Furnacemen, smeltermen, and pourers	18
Heaters, metal	29
Laundry and dry cleaning operatives	15
Meat cutters, except slaughter and packing house	29
Milliners	46

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Mine operatives and laborers (n.e.c.)	10
Gold mining	2
Crude petroleum and natural gas extraction	38
Mining and quarrying, except fuel	12
Motormen, mine, factory, logging camp, etc.	3
Motormen, street, subway, and elevated railway	34
Oilers and greasers, except auto	15
Painters, except construction and maintenance	18
Photographic process workers	42
Power station operators	50
Sailors and deck hands	16
Sawyers	5
Spinners, textile	5
Stationary firemen	17
Switchmen, railroad	44
Taxicab drivers and chauffeurs	10
Truck and tractor drivers	15
Weavers, textile	6
Welders and flame-cutters	24
Operatives and kindred workers (n.e.c.)	18
Manufacturing	17
Durable goods	
Sawmills, planing mills, & misc. wood products	7
Sawmills, planing mills, and mill work	7
Miscellaneous wood products	9
Furniture and fixtures	9
Stone, clay, and glass products	17
Glass and glass products	23
Cement, & concrete, gypsum, & plaster products	10
Structural clay products	10
Pottery and related products	21
Misc. nonmetallic mineral & stone products	15
Metal industries	16
Primary metal industries	15
Blast furnaces, steel works, & rolling mills	17
Other primary iron and steel industries	12
Primary nonferrous industries	15
Fabricated metal ind. (incl. not spec. metal)	16
Fabricated steel products	16
Fabricated nonferrous metal products	15
Not specified metal industries	14
Machinery, except electrical	22
Agricultural machinery and tractors	21
Office and store machines and devices	31
Miscellaneous machinery	22
Electrical machinery, equipment, and supplies	26
Transportation equipment	23
Motor vehicles and motor vehicle equipment	21

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Aircraft and parts	34
Ship and boat building and repairing	16
Railroad & misc. transportation equipment	23
Professional & Photographic equip., & watches	29
Professional equipment and supplies	23
Photographic equipment and supplies	40
Watches, clocks, & clockwork-operated devices	28
Miscellaneous manufacturing industries	16
Food and kindred products	16
Meat products	16
Dairy products	22
Canning & preserving fruits, veget., & sea foods	9
Grain-mill products	14
Bakery products	15
Confectionary and related products	12
Beverage industries	19
Misc. food preparations and kindred products	11
Not specified food industries	19
Tobacco manufactures	2
Textile mill products	6
Knitting mills	21
Dyeing and finishing textiles, exc. knit goods	8
Carpets, rugs, and other floor coverings	14
Yarn, thread, and fabric mills	2
Miscellaneous textile mill products	10
Apparel and other fabricated textile products	21
Apparel and accessories	22
Miscellaneous fabricated textile products	17
Paper and allied products	19
Pulp, paper, and paperboard mills	19
Paperboard containers and boxes	17
Miscellaneous paper and pulp products	19
Printing, publishing and allied industries	31
Chemicals and allied products	20
Synthetic fibers	9
Drugs and medicines	26
Paints, varnishes, and related products	15
Miscellaneous chemicals and allied products	23
Petroleum and coal products	51
Petroleum refining	56
Miscellaneous petroleum and coal products	14
Rubber products	22
Leather and leather products	16
Leather: tanned, curried, and finished	10
Footwear, except rubber	9
Leather products, except footwear	14
Not specified manufacturing industries	16
Nonmanufacturing industries (incl. not reported)	18
Construction	18

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Railroads and railway express service	15
Transportation, except railroad	23
Telecommunications, & utilities & sanitary services	21
Wholesale and retail trade	17
Business and repair services	19
Personal services	11
Public administration	17
All other industries (incl. not reported)	20
<u>Private household workers</u>	
Housekeepers, private household	19
Living in	10
Living out	21
Laundresses, private household	12
Living in	--
Living out	12
Private household workers (n.e.c.)	7
Living in	12
Living out	6
<u>Service workers, except private household</u>	
Attendants, hospital and other institution	13
Attendants, professional and personal service(n.e.c.)	26
Attendants, recreation and amusement	19
Barbers, beauticians, and manicurists	17
Bartenders	19
Boarding and lodging housekeepers	30
Bootblacks	8
Charwomen and cleaners	10
Cooks, except private household	15
Counter and fountain workers	17
Elevator operators	10
Firemen, fire protection	37
Guards, watchmen, and doorkeepers	18
Housekeepers and stewards, except private household	31
Janitors and sextons	9
Marshals and constables	21
Midwives	37
Policemen and detectives	39
Government	40
Private	36
Porters	4
Practical nurses	22
Sheriffs and bailiffs	34
Ushers, recreation and amusement	25
Waiters and waitresses	16
Watchmen (crossing) and bridge tenders	17
Service workers, except private household (n.e.c.)	11

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
<u>Farm laborers and foremen</u>	
Farm foremen	20
Farm laborers, wage workers	6
Farm laborers, unpaid family workers	17
Farm service laborers, self-employed	22
Fishermen and oystermen	10
Garage laborers, and car washers and greasers	8
Gardeners, except farm, and groundskeepers	11
Longshoremen and stevedores	11
Lumbermen, raftsmen, and wood choppers	4
Teamsters	8
<u>Laborers (n.e.c.)</u>	
Manufacturing	8
Durable goods	
Sawmills, planing mills, & misc. wood products	3
Sawmills, planing mills, and mill work	3
Miscellaneous wood products	2
Furniture and fixtures	5
Stone, clay, and glass products	7
Glass and glass products	14
Cement, & concrete, gypsum, & plaster prod.	5
Structural clay products	5
Pottery and related products	7
Misc. nonmetallic mineral & stone products	5
Metal industries	7
Primary metal industries	7
Blast furnaces, steel works, & rolling mills	9
Other primary iron and steel industries	4
Primary nonferrous industries	6
Fabricated metal ind. (incl. not spec. metal)	7
Fabricated steel products	7
Fabricated nonferrous metal prod.	10
Not specified metal industries	9
Machinery, except electrical	11
Agricultural machinery and tractors	14
Office and store machines and devices	17
Miscellaneous machinery	10

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Electrical machinery, equipment, and supplies	14
Transportation equipment	11
Motor vehicles and motor vehicle equipment	13
Aircraft and parts	15
Ship and boat building and repairing	2
Railroad - misc. transportation equipment	8
Professional & photographic equip., & watches	11
Professional equipment and supplies	10
Photographic equipment and supplies	16
Watches, clocks, & clockwork- operated devices	--
Miscellaneous manufacturing indust- ries	12
<u>Nondurable goods</u>	
Food and kindred products	9
Meat products	8
Dairy products	13
Canning & preserving fruits, veg., & sea foods	6
Grain-mill products	6
Bakery products	10
Confectionery and related products	10
Beverage industries	16
Misc. food preparations and kindred products	5
Not specified food industries	14
Tobacco manufactures	0
Textile mill products	3
Knitting mills	4
Dyeing and finishing textiles, exc. knit goods	9
Carpets, rugs, and other floor coverings	14
Yarn, thread, and fabric mills	1
Miscellaneous textile mill products	6
Apparel and other fabricated textile products	9
Apparel and accessories	11
Miscellaneous fabricated textile products	6
Paper and allied products	7
Pulp, paper, and paperboard mills	6
Paperboard containers and boxes	10
Miscellaneous paper and pulp products	8
Printing, publishing, and allied industries	23
Chemicals and allied products	8
Synthetic fibers	4
Drugs and medicines	22
Paints, varnishes, and related products	8

<u>Occupations, by major occupation group</u>	<u>Socio-economic index</u>
Miscellaneous chemicals and allied products	8
Petroleum and coal products	22
Petroleum refining	26
Miscellaneous petroleum and coal products	3
Rubber products	12
Leather and leather products	6
Leather: tanned, curried, and finished	2
Footwear, except rubber	10
Leather products, except footwear	12
Not specified manufacturing industries	8
Manufacturing industries (incl. not reported)	7
Construction	7
Railroads and railway express service	3
Transportation, except railroad	9
Telecommunications, & utilities and sanitary services	6
Wholesale and retail trade	12
Business and repair services	9
Personal services	5
Public administration	7
All other industries (incl. not reported)	6
Occupation not reported	19

APPENDIX D

SUPPORTING STATISTICAL DATA

APPENDIX D.1

Table 29. Adjusted Analysis of Variance for Test of Sales Aptitude, Sales Terms, and Test of Economic Understanding, Form B, with STEP-Reading and Test of Economic Understanding, Form A, as Covariates

	Eleventh Grade (Groups One and Two)				
	Sum of Squares	DF	Mean Square	F	Sig.
Sales Aptitude	.509	1	.509	.041	.82
STEP-Reading	86.049	1	86.049	6.890	.02*
Economics, A	6.895	1	6.895	1.437	.25
Error	199.828	16	12.489		
-----	-----	-----	-----	-----	-----
Sales Terms	7.740	1	7.740	3.055	.11
STEP-Reading	9.015	1	9.015	3.559	.08**
Economics, A	1.092	1	1.092	.431	.53
Error	40.534	16	2.533		
-----	-----	-----	-----	-----	-----
Economics, B	.334	1	.334	.188	.67
STEP-Reading	.540	1	.540	.305	.59
Economics, A	16.680	1	16.680	9.413	.01*
Error	28.358	16	1.772		

* Significant at the .05 level of confidence.

** Significant at the .10 level of confidence.

APPENDIX D.2

Table 30. Adjusted Analysis of Variance for Test of Sales Aptitude, Sales Terms, and Test of Economic Understanding, Form B, with STEP-Reading and Test of Economic Understanding, Form A, as Covariates

	Twelfth Grade (Groups Three and Four)				
	Sum of Squares	DF	Mean Square	F	Sig.
Sales Aptitude	20.863	1	20.863	2.679	.12
STEP-Reading	215.474	1	215.474	27.671	<.005*
Economics, A	111.206	1	111.206	14.281	<.005*
Error	124.594	16	7.787		

Sales Terms	5.693	1	5.693	1.674	.21
STEP-Reading	10.836	1	10.836	3.186	.10**
Economics, A	12.346	1	12.346	3.630	.08**
Error	54.415	16	3.401		

Economics, B	.050	1	.050	.024	.85
STEP-Reading	7.587	1	7.586	3.609	.08**
Economics, A	33.191	1	33.191	15.790	<.005*
Error	33.638	16	2.102		

* Significant at the .05 level of confidence.

** Significant at the .10 level of confidence.

APPENDIX D.3

Table 31. Adjusted Analysis of Variance for Test of Sales Aptitude, Sales Terms, and Test of Economic Understanding, Form B, with STEP-Reading and Test of Economic Understanding, Form A, as Covariates

	Project Method and Cooperative Method Groups (Groups One and Three)				
	Sum of Squares	DF	Mean Square	F	Sig.
Sales Aptitude	121.146	1	121.146	9.045	.01
STEP-Reading	242.249	1	242.249	18.085	< .005*
Economics, A	131.217	1	131.217	9.796	.01*
Error	214.312	16	13.395		
- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Sales Terms	13.550	1	13.550	4.601	.05
STEP-Reading	2.059	1	2.059	.699	.42
Economics, A	6.363	1	6.363	2.500	.13
Error	47.122	16	2.945		
- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Economics, B	1.496	1	1.496	1.592	.22
STEP-Reading	3.783	1	3.783	4.029	.07**
Economics, A	21.752	1	21.752	23.165	< .005*
Error	15.031	16	.939		

* Significant at the .05 level of confidence.

** Significant at the .10 level of confidence.

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