THESIS

This is to certify that the

thesis entitled
A COMPARISON OF STUDENT FACTORS
IN AREA CENTERS
AND LOCAL VOCATIONAL PROGRAMS

presented by

Albert William Fink Jr.

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Education

Major: Vocational-Technical Education

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Major professor

Date 18 February 1981

O-7639

A COMPARISON OF STUDENT FACTORS IN AREA SKILL CENTERS AND LOCAL VOCATIONAL PROGRAMS

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

College of Education

1981

ABSTRACT

A COMPARISON OF STUDENT FACTORS
IN AREA CENTERS
AND LOCAL VOCATIONAL PROGRAMS

By

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Statement of the Problem

This research attempted to provide additional data and information for an ongoing evaluation of vocational education in Michigan. This research was concerned with process as opposed to product and was designed to identify, analyze, and compare students attending area skill centers with those attending local comprehensive high school vocational programs.

Methodology

The first phase of the investigation consisted of a review of the literature in the areas of (1) secondary area vocational education center development, (2) an overview of local school vocational program development, (3) vocational student characteristics, (4) student achievement, and (5) system evaluation. The literature review was tangential due to a lack of research directly related to the study.

The next phase of the research was concerned with data collection. A panel of experts familiar with Michigan vocational education was used to determine the Career Education Planning Districts (CEPDs) possessing dual delivery systems prerequisite for this study.

The student characteristics under study were (1) sex, and (2) academic achievement, i.e., reading and mathematics. Further descriptive data included race, limited English speaking ability, and academic disadvantage of vocational students in the population of four Michigan CEPDs. The sample was drawn from 1979-80 juniors enrolled in vocational education, in area skill centers and local comprehensive high school vocational programs, who took the Michigan Educational Assessment Program (MEAP) test in 1978-79. The MEAP test is an annual, statewide, objective-referenced, competency examination. The sample consisted of four hundred eighty-two students.

The last phase was that of processing and analyzing data. Three testable hypotheses were examined using multivariate analysis of variance to analyze the two interval level dependent variables of MEAP test reading scores and mathematics scores and the three qualitative independent variables of sex, CEPD, and type of vocational school.

Major Findings

The findings are based on the results of the analysis of hypotheses questions and research questions regarding the descriptive data.

Hypothesis Observations

1. Sex is not a factor with regard to achievement of vocational students in mathematics and reading. 2. There is a difference in academic achievement between area skill centers and local vocational programs. The data showed that the scores were higher for local schools on mathematics and higher for area centers on reading. 3. There is a difference in academic achievement between the four CEPDs. The data revealed that there was no difference between the CEPDs on reading scores but that a difference exists on mathematics achievement.

Descriptive Data Observations

The percentage of each racial group in vocational programs in the four CEPDs coincided nearly exactly with the percentage of each group in the general population in the geographic areas studied. This was also true in each of the delivery systems studied. The study revealed that there were 16% more males than females in vocational education with the area centers accounting for the majority of that percentage. It was found that area centers account

for twice as many trade and industry students as local schools. Food preparation programs are nearly exclusively offered in area centers. Distributive education programs are most often found in local schools and had a higher percentage of minorities than other vocational programs. Trade and industry and foods programs also enroll a large percentage of minorities. Trade and industry programs were most popular with white students. The limited English speaking ability students were found to be enrolled in local schools by a difference of seventy-three percent and a large number were enrolled in local office education programs. The area centers enrolled twice as many academically disadvantaged as the local schools. The academically disadvantaged did not tend to concentrate in any particular program.

ACKNOWLEDGMENTS

This writer expresses sincere appreciation to the many persons who contributed to this work.

Special tribute and love is extended to the writer's wife, Linda, for her patience, love and sacrifices as well as for her expertise in typing the several drafts.

This work is dedicated to the writer's parents, Mr. and Mrs. Albert W. Fink, whose continuous encouragement, generosity and love contributed to the completion of this study.

The author extends thanks to the guidance committee members for their contributions of time and talents: Dr. George Ferns, chairman, for the coordination and supervision of the project; Dr. Frank Bobbit for suggesting the topic and assisting in getting the project started; special tribute to Dr. Walter Hapkiewicz for his unselfish tutoring and critical review of the study; and to Dr. Louis Romano.

This writer expresses heartfelt thanks to a personal friend, Mr. Thomas Pierson, CEPD Vocational Technical Specialist, Marquette, Michigan, for his suggestions and generosity in helping to implement the data collection.

Others who generously contributed to the study are Dr. Edward Roeber, M.D.E. Educational Assessment Program; Dr. Mack Seney; Mr. Richard Shupe; and Miss Joan Church, M.D.E. V-TES, Management Information and Finance Unit; Ms. Lynn Zaback, Westinghouse Datascore Corporation; Mr. Robert Pangman, M.D.E. V-TES; as well as the CEPD Vocational-Technical Specialists and secretaries in the participating districts.

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CHAPTER I

INTRODUCTION

In this age of complex technological and societal interactions, there are many systems for dealing with organizational objectives. In industry, when the goal is to produce a product, the industrial organization demands a system for meeting the goal. Because of economic constraints, virtually all of industry has learned to conform to similar methods or models for "getting the job done." Few companies can afford the luxury of producing luxury automobiles if their aim is "producing the finest auto in the world regardless of the cost." In this country all assembly line autos made with that purpose, e.g., Pierce--Arrow and Packard, have long since departed the scene. The education industry promotes systems design in organization and learning theory, but, in actual practice, most local education organizations are still attempting to build extinct products by not using learning systems design.

The reasons for the lack of implementation of learning systems are varied in spite of state and federal guidelines, i.e., state plans for vocational education. Perhaps society, in its collective wisdom, is correct in its insistence

upon a patchwork of methods for dealing with the problems of delivering vocational education. Two alternative systems exist at the secondary level in Michigan: local, i.e., traditional, programs which are part of a comprehensive high school; and area-wide consortiums of cooperating school districts sharing a common facility. A third alternative consists of no delivery system. It would seem that industry has proven that the age of custom-built products is no longer cost effective and that society would do well to conform to the technology it has created.

One technology is that of system design and system evaluation. System design, according to Davis, Alexander, and Yelon, is, "... to view the process as an idealized flow of events."[1] They also address the reason for evaluation for the participant, "Without an evaluation program, he (the learner) cannot show that anything happened. With an inadequate program, he is likely to be misinformed."[2] Wentling and Lawson focus on the role of evaluation for decision makers stating, "... the primary role of evaluation is to provide relevant information and informed judgements to key decision makers ... ."[3] Stufflebeam developed the

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[1]Robert H. Davis, Lawrence T. Alexander, and Stephen L. Yelon, Learning System Design (New York: McGraw-Hill Book Co., 1974), p. 3.

[2]Ibid.

[3]Tim L. Wentling and Tom E. Lawson, Evaluating Occupational Education and Training Programs (Boston: Allyn & Bacon, Inc., 1974), p. 25.

"CIPP" model for evaluation which delineates four categories or components of evaluation--context, input, process, and product.[4] Wenrich and Wenrich add that,

> A frequent critique of educational evaluation is that it has too often focused primarily on process and input, and only secondarily on context and product. As a result, educational goals and objectives are frequently not revised to reflect society's priorities, and institutional operations are not modified in response to the career needs of students and graduates.[5]

It was not this writer's aim to belabor the processes of evaluation in the context of system design but to emphasize the fact that society has recognized the advantages of a systematic approach to vocational education as well as to the manufacturer of material goods, but too often has failed to carry through. The bulk of research done in vocational education encompasses the process and product as evidenced by the profusion of follow-up studies. This study is concerned, not with the delivery system techniques, i.e., educational methods, or the graduates but, simply, the people being served, i.e., the students who are a system input. The Annual and Long Range Plan for Vocational Education in Michigan, 1980, details the following mission and goals.

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[4]Phi Delta Kappa National Study Committee on Evaluation, Educational Evaluation and Decision Making (Bloomington: Phi Delta Kappa, 1971), p. 218.

[5]Ralph C.Wenrich and J. William Wenrich, Leadership in Administration of Vocational and Technical Education (Columbus: Charles E. Merrill Publishing Co., 1974), p. 262.

Mission: Persons of all ages in all Michigan communities will have ready access to high quality vocational and technical education which is realistic in the light of actual or anticipated opportunities for gainful employment and consistent with their needs, interests and abilities.

Goal I: Persons with differing sex, age, racial/ethnic background, socio-economic status, academic disadvantage, economic disadvantage, limited English speaking ability, physical and mental capabilities and geographical location will have access to vocational-technical education and training or re-training and shall not be excluded from such programs because of any distinguishable personal characteristics.

Goal II: All local vocational-technical education programs will be of such quality as to assure that all students are provided learning experiences which are realistic and sufficient in light of their occupational objective.

Goal III deals with career guidance and placement programs. The last goal is,

Goal IV: All local vocational-technical education programs will be planned, monitored and evaluated in light of actual or anticipated employment opportunities and the demand by students for programs related to their abilities and occupational objectives.[6]

State level planners in Michigan have apparently focused on the problem of making vocational-technical education readily

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[6]Michigan Department of Education, Vocational--Technical Education Service, The Annual and Long Range State Plan for Vocational Education in Michigan (Lansing: Michigan Department of Education, 1980), p. 1.

accessible to all residents of the state as indicated in the stated mission. Thus, a system was devised to address the needs of vocational-technical education which would provide essential training for work. The question, however, arises as to whether or not the system is working.

In answer to this question a May, 1978 research report was prepared by several Michigan Career Education Planning District vocational-technical specialists. This group, calling themselves "The Contenders," identified several areas of concern and summarized their observations with the following position:

> The serious problem ..., is the inadequate level of secondary vocational education opportunities available to many students in Michigan. The problem is complex and seems to be magnified by the lack of acceptance of the need to provide more equitable opportunities for all students. The general reluctance to recognize the value of adequate vocational education opportunities for students is demonstrated by various community leaders. Community and school leaders, within their respective roles, appear to be unwilling to alter the traditional secondary program in order to realize adequate secondary vocational opportunities. School districts are unwilling to reallocate their financial, personnel and material resources to provide adequate vocational education opportunities.[7]

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[7]The Contenders, "The Inequality of Vocational Education Opportunities for Michigan High School Students" (Indian River, Michigan: Cheboygan-Otsego-Presque Isle Intermediate School District, 1978), p. 3.

The Contenders report suggests that if a statewide system does exist, it does not work well in giving equal opportunity to all Michigan residents.

Although the Michigan Department of Education collects data to substantiate that the vocational-technical education goals are being met, the issue is, however, not one of whether the "letter of the law" is being kept. The issue is which type of vocational delivery system will predominate. On the one hand are the proponents of big government and centralized power advocating area centers, and on the other are community leaders attempting to maintain the autonomy and individuality of local vocational programs. Oddly enough, with so much at stake, there was no evidence of any research comparing the people most affected by the delivery systems--the students themselves.

Student data exists for accounting purposes; however, it appears that scholarly comparisons have not been made with regard to sex, race, socioeconomic status, academic standing, limited English speaking ability or limited physical and mental capabilities. There is some evidence that a discrepancy exists between students enrolled in college preparatory courses and vocational programs. Evans and Galloway reported in 1973 that, based upon the Project TALENT national research of 1960, students from high socioeconomic status and high academic ability tend

to be assigned to college preparatory curricula.[8]

This probably would not surprise most vocational educators. However, if, ... "children are sometimes placed in school programs on the basis of race or socioeconomic status rather than achievement ... ,"[9] research should be done to see if there are differences between those students attending area centers versus those attending local vocational programs. Vocational education decision makers should not be fighting about who is going to get money for what type of system until a careful comparative evaluation has been made with regard to factors concerning the students being served.

Statement of the Problem

Vocational education of some kind has been a necessary component of society since earliest times when parents taught their offspring the skills necessary for existence. The essence of it has not changed throughout history, only the methods of delivery. As society became more complex, the duty of training for vocations has been delegated to

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[8]Rupert N. Evans and John D. Galloway, "Verbal Ability and Socio-Economic Status of 9th and 12th Grade College Preparatory, General and Vocational Students," The Journal of Human Resources 8 (1) (1973): 24-36.

[9]Ella Mae Bowen, "Factors Related To Teacher Assignment of Students to School Curricula" (Ph.D. dissertation, University of Illinois, 1975), p. 4.

other people and to institutions. This de-personalization of education has had the side effect of making it difficult to ensure that each delivery system achieves the goals of the society for which it was established. American legislation has determined that all persons must be included in meaningful individual activity, and that goal is reflected in documents such as state plans for vocational education. Schools often leave out many individuals through various conscious and unconscious methods, thus, some of the goals of maximizing the options of all people are not met. Society, as an organization, must continually evaluate its goals and the systems created by it for meeting its goals. J. C. Ruppert supports this saying, "The main purpose of evaluation is improvement."[10]

The purpose of this researcher is to provide one more input in the process of evaluating social institutions. A common cliche states, "there is always room for improvement," and it is the assumption of this researcher that improvements may be needed in optimizing the options of persons who are or might be attending various vocational schools. Elected and appointed officials must seek to remedy gaps between stated societal goals and the real educational situation.

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[10]J. C. Ruppert, "Evaluating Trade and Industrial Education," Guidelines for the Seventies: American Vocational Association: Yearbook, ed. Von H. Robertson (Chicago: American Technical Society, 1967), p. 72.

If inconsistencies between goals and situations do exist, decision makers must take action to correct the discrepancies. This study will provide information for educators and decision makers so they may have another source of input in the continuing process of evaluation of who is being serviced or educated by vocational education in area skill centers and vocational education in local comprehensive high schools. A second desired result of this research is to provide information that will assist teachers and counselors in the guidance function, thus, increasing the options of individual learners in life. Evans indicates several factors which increase or decrease the options of the individual, stating that an individual's options should not be left to chance:

> Income beyond the amount required for subsistence generally increases an individual's options as does athletic ability, verbal intelligence, manipulative skill and almost every attribute which is valued by society. Options are decreased by prejudice, poor education, social isolation, poor health, and many other factors. Some of these factors are under the control of society or of the individual, and some are not. It should be a major goal of society to strive to bring more of these factors out of the realm of chance and put them under the control of individuals and groups of individuals.[11]

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[11]Rupert N. Evans, Foundations of Vocational Education (Columbus: Charles E. Merrill Publishing Co., 1971), p. 30.

Academic achievement, race, sex, academic disadvantage, and limited English speaking ability are factors affecting options and were studied in relation to two vocational delivery systems.

Purpose of the Study

This study was designed to analyze and compare students attending area skill centers with those attending local high school vocational programs. The student characteristics under study were (1) sex, (2) race, (3) academic achievement, (4) economic disadvantage, and (5) limited English speaking ability.

At this point it must be emphasized that a major unforseen problem arose in the data collection which made it impossible to obtain the necessary data to analyze the proposed dependent variable--socioeconomic status. The Michigan Educational Assessment Program had at one time reported socioeconomic status, however, the socioeconomic data collection has been discontinued. Therefore, this researcher attempted to use eligibility for the free or reduced fee hot lunch program as a measure of socioeconomic status. It was discovered that the data was only available in individual student files and not uniformly reported in summary form or on student lists. Also, some of the schools refused access to the data. Therefore, this

researcher reluctantly dropped the factor of socioeconomic status from the analyses.

Hypotheses to be Tested

The intent of this investigation is to identify, analyze and compare factors relating to students attending area skill centers with students enrolled in local comprehensive high school vocational programs. The factors to be studied are sex, and academic achievement in reading and mathematics.

The following null hypotheses are formulated with regard to the two populations of students in local vocational programs and area centers:

1. There is no difference by sex on reading and mathematics scores within the two populations of students.
2. There is no difference by school type for the population of students on reading and mathematics scores.
3. There is no difference by Career Education Planning District (CEPD)[12] on reading and mathematics scores.

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[12]See definition on Page 16.

Research Questions

The following research questions are asked with respect to the demographic and program characteristics of the two populations of students in local vocational programs and area centers.

1. Who are the two types of vocational delivery systems serving?
2. Which programs are the students of the population of this study enrolled in and in what numbers?
3. Which programs are found to predominate in area centers and which programs are found to predominate in local school vocational systems?

Methodology

A two-fold procedure was used to collect the data for this project. The first method was to use existing Michigan Department of Education (MDE) data which originated from information furnished to the Vocational-Technical Education Service (V-TES) by the local districts. The second method was to sample student record data at the schools under study to gain information not available in either MDE or V-TES records.

Michigan Department of Education data exist on race, sex, economic disadvantage, and limited English speaking

ability for individual schools and districts. The purpose of sampling students' records is to learn about student achievement with respect to language skills, mathematical ability, and reading comprehension. A statistical comparison was made of the variables or factors under consideration using the multivariate analysis of variance.

Importance of the Findings

It is felt that the findings of this study will make an important scholarly contribution because, although there has been great emphasis on the importance of career education and vocational education, the relationship between these concepts and the factors of individual characteristics have not been systematically studied. Dr. Rupert Evans (Professor of Education, University of Illinois) indicated to this researcher that, "To my knowledge this has not been researched," and further indicated that, "A definite need exists to determine who is going to the area centers ... ."[13]

As indicated previously, the "mission" of the State Plan for Vocational Education in Michigan (1980) is that,

> Persons of all ages in Michigan communities will have ready access to high quality vocational and technical education which is realistic in the light of actual or anticipated opportunities for gainful employment and consistent with their needs, interests and abilities.[14]

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[13]Rupert N. Evans, telephone interview, 10 May, 1979.

[14]Michigan Department of Education, Vocational--Technical Education Service, The Annual and Long Range State Plan for Vocational Education in Michigan, p. 1.

In addition, it indicates that, "Persons ... shall not be excluded from such programs because of any distinguishable personal characteristics."[15]

A variety of follow-up studies have been undertaken to determine whether vocational education programs comply with the mission by studying employment characteristics of their graduates. However, the challenge exists to determine who is attending these programs as regards abilities, academic achievement, race, and sex.

Assumptions of the Study

The basic assumptions of the study were that

1. certain characteristics of students in local vocational programs and area centers can be compared and assessed
2. the data used for this study, gained from MDE enrollment statistics, are accurate
3. the students in the schools under study are representative and, thus, the conclusions can have relevance to other similar situations
4. the communities identified as meeting the criteria for the study are representative of a cross section of society.

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[15]Ibid.

Limitations of the Study

The limiting factors of this study were that it is limited

1. to data obtainable from Michigan Department of Education data and local district records
2. by the resources of this researcher
3. to four Career Education Planning Districts in Michigan
4. to 1979-80 eleventh grade vocational students who took the 1978-79 Michigan Educational Assessment Program test for reading and mathematics achievement
5. by the fact that some districts were not willing to participate in this study
6. by the fact that participation in the Michigan Educational Assessment Program was not mandatory for all school districts in 1978-79
7. by the unavailability of socioeconomic data on students taking the Michigan Educational Assessment Program test.

Definition of Terms

The definition of terms applicable to this study is presented below.

Academic Standing or Achievement. As used in this study, academic achievement is how students are performing with respect to mathematics and reading, measured against what the State of Michigan wants them to know and be able to do. This is measured by objective-referenced tests administered annually by the Michigan Educational Assessment Program.

Area Center. A specialized high school used solely or principally for the provision of vocational education, primarily for eleventh and twelfth grade students, and supported by a joint agreement whereby two or more school districts cooperate in financing the operation of a total vocational program.

Academic Disadvantage. Academic disadvantage refers to the ability of a student who (1) lacks reading and writing skills, (2) lacks mathematical skills, or (3) performs below grade level.

Career Education Planning District (CEPD).

> A group of educational agencies including K-12 districts, community colleges and intermediate school

> districts located in geographical proximity of one another and organized to increase the opportunities for people to become and remain adequately prepared for life and for work.[16]

CEPD Coordinator. An administrator of a CEPD whose duties include: (1) coordinating the development of the CEPD annual plan, (2) serving as liaison person between the Michigan Department of Education and the CEPD, and (3) assisting in establishing and providing leadership for the CEPD coordinating council.

Local Vocational Program. Vocational education for persons in grades nine through twelve in a local comprehensive high school.

State Plan. The Annual and Long Range State Plan for Vocational Education in Michigan.

V-TES. Vocational-Technical Education Service of the Michigan Department of Education.

Summary

The first section of this chapter offered an introduction to the problem under study by detailing the issue of whether or not vocational offerings in Michigan are

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[16]A Michigan Department of Education, Vocational--Technical Education Service document, (n.d.), p. 3.

equal and the attendant problems of systematic evaluation. The concept of social stratification as a societal or organizational means to an end was broached. The opinion of The Contenders report, 1978, was presented to anchor one side of the issue as was the "mission" of the Michigan Department of Education State Plan to establish a base for this research.

The second section of Chapter I presented a statement of the problem followed by the purpose of the study in which the goal and objectives were stated. The section dealing with importance of the findings linked the goal with the contributions it can make to vocational-technical education. The assumptions and limitations of the study, definition of terms, this summary and the organization of the remaining chapters of this work complete Chapter I.

Organization of the Study

Chapter II will present a review of related and pertinent literature to the problem of the study. This chapter is subdivided into five parts: (1) background of area centers, (2) sketch of local program development, (3) examination of typical or ideal districts, (4) student achievement and other factors, and (5) system evaluation.

Chapter III will outline the methodology or procedure of this study. It deals with data collection, procedures

for data processing, procedures for data analysis, and data interpretation.

Chapter IV will present an analysis and interpretation of data and is subdivided into three major sections: descriptive analysis of data, tests of hypotheses, and summary of findings in the study.

Chapter V will present the summary, conclusions, implications, recommendations for further research, and commentary.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

There appears to be a dearth of literature germane to the problem being investigated. This conclusion has been reached based upon extensive manual and computer-assisted searches. The computer-assisted searches were undertaken at the Michigan State University Library utilizing BRS.[1] BRS is a computerized information retrieval system which was employed to scan three independent data bases: Education Resource Information Center (ERIC), Dissertation Abstracts, and Social Sciences Cumulative Index (SSCI).

The researcher's exploration of conventional library related sources, such as indexes, books, journals, and abstracts also yielded little directly related to the study. The following experts substantiated this researcher's findings about the absence of related literature: Dr. Lawrence Borosage, Professor of Education, Michigan State University; Dr. Rupert N. Evans, Professor of Education, University of Illinois; Mr. Robert Pangman, Supervisor of Planning Unit

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[1]Bibliographic Retrieval Services, Inc., Corporation Park, Building 702, Scotia, New York 12302.

at the State of Michigan Vocational-Technical Education Planning Unit; and Dr. Branden Smith, Professor of Education, University of Minnesota and Director of the Minnesota Research and Development Center.

Because of the scarcity of pertinent related literature, it was necessary to use information tangentially related to the problem under investigation. The review of the literature considers the available research pertinent to the selected variables and their relationship to the study. The major emphasis of this review focuses upon the areas of (1) vocational delivery systems, (2) student characteristics useful for evaluative purposes, and (3) system evaluation.

The problem in this investigation was concerned with identifying and assessing differences between two vocational education delivery systems. It is hoped that responsible educators will rectify the discrepancies that may be shown to exist through research efforts. In order to attack the problem, it was assumed that a selection by educators and parents occurs in the separation of students into various types of vocational systems and, for that matter, into other types of education. Whatever process occurs, it would seem that if there were significant differences between students as regards achievement and demographics, this would indicate inequalities in the vocational education system.

The treatment of the literature review in this work serves the following purposes. First, the traditional one is to establish a foundation upon which the investigation can be constructed. Secondly, and also traditionally, to provide a structure or framework within which the study's various components or factors can be organized.

For structural purposes, the review is concerned with (1) background of area centers, (2) a sketch of local vocational program development, (3) an examination of ideal or typical districts, (4) characteristics of vocational students, (5) student achievement, and (6) system evaluation.

Background of the Secondary Area Vocational Education Center

The secondary vocational education center's purpose is to provide vocational education for youth in participating local kindergarten through twelfth grade districts. The area centers are part of a federally mandated system of vocational education and offer programs to individual districts which on their own could not normally offer full services either because there were not enough students and/or insufficient funding. The system is a result of the international political scene of the late 1950s in which the United States of America found itself in need of technical manpower to counteract agressive motions by the Soviet Union. In addition to aiding national defense, a comprehensive

vocational delivery system could yield economic gains. If vocational training were available to larger numbers of persons, the labor force would be more productive and could improve from the employment rate and national productivity. Robert A. Pangman of the Michigan Department of Education recognized the factors listed above and indicated yet another dimension:

> This problem is more than one of economics; it is a problem affecting human worth and dignity. Many of today's social and economic ills result from a lack of employment among those who are capable of being occupationally productive citizens.[2]

Although the Vocational Education Act of 1963 is credited with providing the real impetus for the development of area centers, the concept of centers themselves was by no means new.[3] Roberts reports that as early as 1903 the state of Connecticut had a commission appointed to "investigate practical means and methods of industrial and technical education."[4] Connecticut implemented a system of vocational-technical schools in 1910. The schools were and continue

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[2]Robert A. Pangman, "Cooperative Efforts Pay Big Dividends," Michigan Challenge, 8 (Nov.-Dec. 1971): 19-22.

[3]Vocational Education Act, Statutes at Large, LXXVII, sec. 403 (1963).

[4]Charlie Delmer Roberts Jr., "A Comparative Analysis of Secondary Graduates of Area Vocational Programs and Local Vocational Programs in the State of Michigan" (Ph.D. dissertation, Michigan State University, 1979), p. 16.

to be what are considered today area schools. Other states have had programs which generally met the criteria for area centers prior to 1963 using such methods as circuit riders and mobile laboratories.

Title VIII of the United States National Defense Education Act of 1958 indicated the need for highly skilled technicians in occupations essential to the national defense.[5] This Act was, of course, the reaction to the Soviet Union's launching of the Sputnik satellite. The actual enabling legislation was the United States Vocational Education Act of 1963[6] which gave direction and financial assistance to all states to develop solutions to the problem of insufficient occupational preparation in technical fields due to a lack of educational opportunities.[7]

Michigan occupational education leaders decided that an evaluation of present needs and programs was necessary before any delivery systems could be implemented.[8] Between 1965 and 1971, forty-two area vocational-technical education

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[5]National Defense Education Act, Statutes at Large, LXXII, sec. 1580 (1958).

[6]Vocational Education Act, Statutes at Large, LXXVII, sec. 403 (1963).

[7]Michigan Department of Education, "Michigan Area Skill Centers," Michigan Education 41 (Dec. 1971-Jan. 1972): 1-3.

[8]Pangman, "Cooperative Efforts Pay Big Dividends," p. 19.

studies were completed at the urging of the Michigan Department of Education. Pangman asserts that,

> Each study was asked to answer three basic questions:
>
> 1. What are the occupational education needs of business, industry, agriculture and citizens seeking employment in the area being studied?
>
> 2. What programs now exist which assist in meeting the occupational education needs identified?
>
> 3. What new programs should be developed, where should they be located, and how should they be financed?[9]

Pangman's summary of the forty-two studies made apparent that most local education agencies lacked adequate numbers of students and financial resources to offer comprehensive vocational-technical programs. The problem of inadequate numbers and resources led to implementation of cooperative efforts across district lines. This cooperation resulted in area vocational-technical education centers.

Any educational delivery system must have a definition of what it is to enable citizens to respond to it, to invite evaluation, and to recruit students. The Michigan Department of Education in 1970 defined an area vocational center as:

> ... a centrally located facility designed and equipped to provide vocational education courses for a number of school districts. Such a cooperative arrangement makes the high

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[9]Ibid.

> school comprehensive and gives the student a wider choice of courses, and makes possible more up-to-date laboratory facilities and educational equipment to meet the demands of the modern working world. The center may consist of one building or several. Students who select the expanded and improved courses offered by the center remain at their home high school for all classes, sports, and other activities--except for those special vocational classes not offered locally. The home high school provides transportation. Such area vocational programs meet the occupational training needs of both in-school and out-of-school youth, and adults.[10]

The 1979 Annual and Long Range State Plan for Vocational Education in Michigan uses essentially the same definition but defines the students and agencies as follows:

> Area vocational center students are normally enrolled in grades 11 and 12 ...
>
> Secondary area vocational education centers may be owned and operated by K-12 districts, intermediate school districts, and community colleges. The delivery system alternatives selected at the local level are based upon a plan developed by the educational agencies forming the area vocational education program.[11]

In 1970 the Michigan State Board of Education approved "A Tentative Plan for the Development of Area Vocational Education Centers in Michigan." The plan was to, "... serve as a guide for the effective and efficient development of

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[10]Michigan Department of Education, Who Me ... Need Area Vocational Education Centers? (Lansing: Michigan Department of Education, 1970), p. 2.

[11]Michigan Department of Education, Vocational--Technical Education Service, The Annual and Long Range State Plan for Vocational Education in Michigan, p. 2.

high school and post-high school area programs."[12] The plan advocated seventy-eight area centers at the high school level in addition to the twenty-nine community college post-secondary institutions. The plan also stressed maximum cooperation between the secondary and post-secondary institutions in order to facilitate maximum use of the facilities.[13] Area centers have had a precise history and are a recent development in vocational education. Local school vocational program offerings have, by contrast, had a very erratic development.

Overview of Local School Vocational Program Development

According to Rupert N. Evans there are,

> ... three basic objectives in any public school vocational education curriculum:
>
> (1) meeting the manpower needs of society, (2) increasing the options available to each student, and (3) serving as a motivating force to enhance all types of learning.[14]

With these objectives in mind vocational education can be very broadly interpreted. Occupational education can encompass anything from teaching a service station attendant to

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[12]Michigan Department of Education, "Michigan's Area Skill Centers," Michigan Education, p. 2.

[13]Ibid.

[14]Evans, Foundations Of Vocational Education, p. 2.

act as a cashier to preparing a physician. It becomes obvious that with such diverse occupational purposes a flat proposal to review even that segment of occupational education which is vocational would be a monumental task.

This study concentrates on vocational-technical occupations of a less than professional level. This overview will sketch the development of vocational education in relationship to the federal legislation affecting it. Nystrom characterizes the role of legislation on educational history in the United States as follows:

> Although the classic curriculum has tended to deal more with educational philosophy than with educational legislation and although students traditionally prefer such emphasis, federal and state legislation has had more impact on the development of formal education in the United States than all the Rousseaus, Herberts and Deweys combined.[15]

According to Nystrom, the "early" occupational education legislation covered the span of years from the Morrill Act of 1862 to the George-Barden Act Health Amendments of 1956 and was composed of three major phases.

The first phase was characterized by legislation aimed at solving the problems of agriculture in the newly settled areas after westward expansion. As the United States became expanded industrially and was subject to the shortages of

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[15]Dennis C. Nystrom, Occupation and Career Education Legislation (Indianapolis: Howard W. Sams & Co., Inc., 1973), p. 5.

skilled technical manpower associated with World War I, it entered the second phase of specific occupational legislation. One of the country's most significant occupational education Acts was the Smith-Hughes Act of 1917.[16] The legislation provided an annual sum of 7.2 million dollars. The sum was to be matched on a 50-50 basis by the states for the improvement and operation of programs in home economics, agriculture, and trade and industry. This legislation has been examined in so many studies that it is unnecessary to expound on it here. Suffice it to say that much of what it promoted has lasted until now and certainly has an impact on modern students. By comparison, other legislation of that era was anti-climatical.

The third phase encompasses post-World War I industrialization, the Depression of the 1930s and World War II with its post-war problems. It is a period highlighted by social change, industrialization, and unemployment. The era's significant legislation was the Vocational Education Act of 1946 (George-Barden Act).[17] The overriding emphasis was on greater state level control of the 28.5 million dollars distributed annually. This policy of more flexible funding

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[16] Smith-Hughes Act, Statutes at Large, XXXIX, sec. 926 (1917).

[17] Vocational Education Act, Statutes at Large, LX, sec. 775 (1946).

helped to meet the regional or local needs of a changing society.

It wasn't until the period of 1958 to 1968, however, that local needs and social needs were given high priority resulting from the competition between the U.S.A. and the U.S.S.R. in space exploration. Nystrom characterizes the decade as follows:

> ... the total emphasis on education moved from highly skilled, centrally controlled, technical education programs to a culturally oriented, local-need type of program.[18]

The legislation was not perfect, thus, legislative amendments were necessary to "tune" the enactments to then current needs.

The Vocational Education Act of 1963 [19] emphasized program flexibility and was people oriented to address the needs of a changing labor market.[20] In order to insure conformity with federal goals for the allocated monies, the states were required to have a state plan for vocational education that served as a contract with "Washington" delineating policies, procedures and controls for using federal funds.

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[18]Nystrom, Occupation and Career Education Legislation, p. 32.

[19]Vocational Education Act, Statutes at Large, LXXVII, sec. 403 (1963).

[20]Gerald B. Leighbody, Vocational Education in American Schools (Chicago: American Technical Society, 1972), p. 7.

A state, in accordance with its approved state plan, was able to use federal funds for any or all of the following purposes:

1. Vocational education for persons attending high school.

2. Vocational education for persons who have completed or left high school and who are available for full-time study in preparation for entering the labor market.

3. Vocational education for persons (other than persons who are receiving training allowances under the Manpower Development and Training Act of 1962, the Area Redevelopment Act, or the Trade Expansion Act of 1962) who have already entered the labor market and who need training or retraining to achieve stability or advancement in employment.

4. Vocational education for persons who have academic, socioeconomic, or other handicaps that prevent them from succeeding in the regular vocational education program.

5. Construction of area vocational education school facilities.

6. Ancillary services and activities to assure quality in all vocational education programs.[21]

Of primary concern for this study are items one and five. Program and facility development were seen as logical means to meet the needs of society and the individual.

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[21]Nystrom, Occupation and Career Education Legislation, p. 38.

In 1956 Byram and Wenrich had indicated that,

> ... the needs of individuals in the field of vocational preparation cannot be considered entirely apart from those of society or from the total educational needs of the individual.[22]

During the period preceding the 1963 Act, many people were painfully aware of the two world wars in which the United States participated with a shortage of skilled manpower. Industry, too, had become very sophisticated and the future degree of sophistication staggered the imagination.

Vocational leaders became concerned about meeting our country's needs in the event of another national crisis, not to mention the need for technical manpower for industrial growth. Critics became concerned with individuals and their ability to cope in a rapidly increasing technological spiral. The result, therefore, was an emphasis upon meeting local needs which led to expanded vocational programs and facilities. Many local vocational programs continued to function and grow alongside the new area centers, thus, providing alternatives not previously possible for either the communities or their residents.

Ideal Districts

This study is concerned with examining two distinct vocational delivery systems that exist within one or more

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[22]Harold M. Byram and Ralph C. Wenrich, Vocational Education and Practical Arts in the Community Schools (New York: Macmillan Co., 1956), p. 184.

service areas. In an interview with Robert A. Pangman, he indicated that there are few service areas or districts which approach this "ideal" situation.[23] This ideal situation would include one or more traditional vocational programs which are part of a comprehensive high school and an area center which provides vocational education classes with the same occupational education code number. As one examines service areas in a search for the ideal district, for purposes of research, one must keep in mind that many factors influence the existence of the varied programs and curriculums. Although educational planners sometimes seem to want each district to be a carbon copy of the next, local citizens demand autonomy, thus, maintaining diversity of delivery systems.

"Every curriculum is a reflection of the philosophy of those who create it and bespeaks the program goals which they most value."[24] In general, most delivery systems emphasize general education and occupational training because of society's insistence upon the "basics" as well as vocational specialization. The emphasis upon a basic or general education results from the desire of industry for an employee,

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[23]Robert A. Pangman, interview, (Leonard Building, Lansing, Michigan) 4 September, 1979.

[24]Leighbody, Vocational Education in American Schools, p. 63.

"... who has been educated to understand what is going on around him, and who knows how to communicate."[25]

This idealistic opinion of Admiral Charles Horne, a president of General Dynamics Corporation, is not representative of all of industry and society, thus, the inclusion of the above qualifier, "In general ... ." One major Michigan employer interviewed by this researcher stated that he wished to employ only those who have absolutely "no more than the minimum qualifications" needed to function as operatives in his food processing plant. He would not have them "thinking too much" and educated to understand what is going on around them. This dichtomy of philosophy illustrated by Horne and the plant manager, leads to differences between districts, for influential leaders may manage to impose their own philosophies in their respective districts.

An "ideal" district, in effect, probably does not exist; however, enough of the commonly held beliefs about basic education and occupational education exist in both systems to warrant investigation of several districts to determine if differences exist between groups within the populations of each and across populations.

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[25]Great Cities School Improvement Council. Report of the Western Regional Conference on Vocational Education. (Chicago: The Research Council of the Great Cities Program for School Improvement, 1967), p. 78.

Characteristics of Vocational Students

It would seem that ample data would be available on the characteristics of students in secondary vocational programs since such a large investment has been made in this area. Just the opposite is the case; there is a very limited amount of reported data on these students. Evans[26] and Borosage[27] both stated that virtually no studies have been conducted which examine the characteristics of vocational students.

This researcher learned that most studies are not investigating current school populations and take the form of follow-up studies on graduates. The general concerns of the follow-up studies and some studies at the post-secondary level include course grades and placement, socioeconomic status, and occupational choice. This study will concern itself with characteristics students in the two delivery systems possess relative to academic achievement. In spite of the inability to obtain socioeconomic data for this research, it is thought that it is a most important student characteristic and worthy of mention in this review. In order to document what is known of socioeconomic status and grades as they relate to vocational education students, it is necessary to cite tangential studies. Ella Bowen reported

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[26]Rupert N. Evans, telephone interview, June 1979.

[27]Lawrence Borosage, interview (Michigan State University, East Lansing, Michigan) 4 October 1979.

in her review of the literature that, (a) students in occupational programs come from families in which the parent or parents are from a lower socioeconomic strata than their counterparts in academic programs. Bowen cited one exception among her hypotheses in which the study reported no significant difference between the parental occupations, i.e., socioeconomic status of the college preparatory versus occupational preparatory students; (b) ... "that occupational students tend to score slightly below academic students on high-school grade point average."[28] She concludes, "... that occupational students as a group tend to have patterns of characteristics which are similar within and different between curricula."[29] That is, students in one curricula will be relatively homogeneous but not necessarily like others in other curricula who also possess certain relatively homogeneous patterns.

In discussing socioeconomic status, Schaefer and Kaufman support Bowen's statements when they state that, "Using fathers' occupations as a measure of socioeconomic status, it is clear that from low to high the ranking of curricula is vocational, general, and college preparatory,

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[28]Bowen, "Factors Related to Teacher Assignment of Students to School Curricula," p. 33.

[29]Ibid., p. 34.

with each being approximately equally spaced along the continuum."[30] They recognize the possibility of differences between the quality of vocational programs in separate vocational schools and those operated in local comprehensive high schools and state that there is no information to support the hypothesis that separate vocational schools are superior in any way.[31] They further submit that, "While the lack of data is unfortunate, the information which is available suggests that separate vocational schools have higher costs, higher dropout rates and seem to promote socioeconomic segregation."[32]

Roberts, in his doctoral study, sets out, "to provide comparative data showing whether the occupational achievement in the business and industrial world was any better for the graduates of area vocational programs when compared to the graduates of local programs."[33] The criteria he

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[30]Carl J. Schaefer and Jacob Kaufman, Occupational Education in Massachusetts (Boston: Massachusetts Advisory Council on Education, 1968) pp. 74-76 cited by Rupert N. Evans and Edwin L. Herr, Foundations of Vocational Education, 2nd ed. (Columbus: Charles E. Merrill Publishing Co., 1978), p. 216.

[31]Ibid., p. 219.

[32]Ibid., p. 219.

[33]Roberts, "A Comparative Analysis of Secondary Graduates of Area Vocational Programs and Local Vocational Programs in the State of Michigan," p. 81.

employs for occupational achievement is, basically, the extent to which graduates of vocational programs are employed based on the training received. Roberts concludes that Michigan local program graduates have better occupational achievement than those of area vocational programs.

Student Achievement

The measurement of student achievement is a science which serves many purposes. It is generally used to examine curricula developments, evaluate educational programs, analyze student progress in specified skills, and aid in curriculum planning. Occasionally, special interest groups are guilty of incorrectly citing data to support their purposes. Student achievement, especially the success of vocational program graduates, is often used to enhance the perceived position or status of vocational programs.

The status of vocational programs is affected by public perception of socioeconomic status and student achievement. This leads to the prevalent screening that is aimed at ensuring "quality" vocational programs. Thus, occupational education seems to mirror a dilemma with respect to the same problem in society as a whole, as Cuber and Kenkel noted over twenty-five years ago.

> ... there is one indictment which the stratification system of the United States cannot escape, namely, the waste of talent due to the inability of the society to find ways to stimulate and/or allow individuals of high intelligence but low

> parental status to realize their potential for educability, even though part of this failure is admittedly rooted in the low aspirational levels of many. People are not born with low aspirations; they learn them; and they learn them from their experiences and those of their families and peer groups.[34]

Identifying the socioeconomic status of vocational students and whether or not this is a reflection of socioeconomic status in society as a whole is not to be debated here. The problem is stated to emphasize that this research recognizes that other characteristics of students, such as socioeconomic status, may impinge upon the findings and conclusions. The findings are further complicated by the tendency of vocational educators to be sensitive as to the status of their vocational programs.

Numerous problems arise when vocational educators demand parity regarding the status of their individual programs and vocational education as a whole. One can theorize that a relationship may exist between "screening of students" for vocational education, having "quality" programs and the perceived status of vocational education in general. Thus, when comparing characteristics of students, the researcher must be aware that many forces are at work which may act individually or in combination to affect those characteristics. Although socioeconomic status, academic achievement and program status are frequently

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[34]John F. Cuber and William F. Kenkel, Social Stratification in the United States (New York: Appleton-Century--Crofts, Inc., 1954), p. 333.

intertwined as in the preceding discussion, it may be redundant to examine the socioeconomic factors in terms of the traditional measures of class hierarchy. This is supported by Williams' statement that, "In part because of the availability of the data, a great many investigations have utilized occupation as the defining mark of class."[35] This research is concerned only with occupations generally considered lower than semi-professional by virtue of their being taught in vocational programs. Williams supports this method asserting,

> The usefulness of this approach is apparent; in our modern society a person's occupation is one of the most important determinants of his whole way of living. Occupation alone, however, will not identify social class position. Unfortunately, data corresponding to the elements affecting stratification ... are as yet extremely scanty and accordingly we shall be forced to rely heavily upon occupation as a rough index of social rank.[36]

Thus, the final point to be made here is that socioeconomic status, for the purpose of this study, is not nearly as important as other considerations such as achievement, sex, English speaking proficiency, academic disadvantage and others. In fact, the vocational movement began with a strong commitment to serving the needs of the lower social classes and it took pride in doing so. It would

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[35]Robin M. Williams Jr., American Society (New York: Alfred A. Knopf, 1965), 2nd ed., p. 93.

[36]Ibid., p. 93.

appear, from examining the occupations taught, that the lower classes are still the predominant ones being served by vocational education at the secondary level.

Hauser indicated at least three kinds of educational performance--academic achievement, course marks, and aspiration--and oriented them to evaluating socioeconomic theories of educational performance.[37] It might be interesting to examine socioeconomic theories relating to vocational education, however, practical considerations dictate that academic achievement be of major importance in this study. Course marks were considered as a factor for this research; however, the fact remains that, as a private citizen, the Right to Privacy Act effectively denies access to student names and records.[38] Aspiration also was considered as a factor and is addressed in this research by recognition of the fact that the students are aspiring to practice certain occupations by their presence in specific occupational training. Therefore, this researcher must concentrate on educational performance.

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[37]Robert M. Hauser, Socioeconomic Background and Educational Performance, The Arnold and Caroline Rose Monograph Series in Sociology (Washington, D.C.: American Sociological Association, 1971), p. 57.

[38]Family Educational Rights and Privacy Act, Statutes at Large, LXXXVIII, sec. 484 (1974).

Hauser lists achievement in mathematics and reading as the two indicators of educational performance.[39] The Michigan Educational Assessment Program (MEAP) uses objective-referenced tests in reading and mathematics at the fourth, seventh and tenth grades to determine the extent to which students in the local school districts learn the basic skills.[40] The origins of the MEAP are as follows:

> The program was initiated by the State Board of Education, supported by the Governor, and funded by the Legislature initially through enactment of Act 307 of the Public Act of 1969, and subsequently under Act 38 of the Public Acts of 1970.[41]

The Michigan Education Assessment Program made use of norm-referenced tests from 1969-1973. Bormuth made the following observation of norm-referenced tests:

> Achievement tests made by traditional methods have been used to measure the growth in a student's attainment and to compare his level of attainment with the levels reached by other students and norm groups, but they have generally been regarded as useless for determining the effectiveness of instructional programs.[42]

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[39]Hauser, Socio-Economic Background and Educational Performance, p. 57.

[40]Michigan Department of Education, Michigan Educational Assessment Program Handbook 1979-80 (Lansing: Michigan Department of Education, 1979-80), pp. 1-6.

[41]Martha S. Caswell, "A Review of the Michigan Educational Assessment Program (MEAP)." (paper, Michigan Department of Education, 1979 mimeographed).

[42]John R. Bormuth, On The Theory of Achievement Test Items (Chicago: University of Chicago Press, 1970), p. 15.

He further states, "What is urgently needed is some way to compare the student's score with the criterion of mastery of the content."[43] R. Glaser called these tests criterion--referenced tests to distinguish them from the norm-referenced tests.[44] The Criterion-referenced tests take a "sample of objectives under a criteria and interpret the results in relation to the criteria of the domain as a whole;"[45] whereas, the objective-referenced tests are more specific or limited to the objectives being measured. The Michigan Department of Education decided that the information provided by the norm-referenced tests did not adequately serve the purpose of the MEAP and replaced them with objective-referenced tests in the 1973-74 school year.

The brochure, Common Goals of Michigan Education, emphasizes measurement of mastery of basic skills that students must learn and, thus, provides the impetus for objective--referenced tests.[46] Caswell describes the development of the objectives to be tested:

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[43]Ibid.

[44]Ibid.

[45]Sharif Shakrani, Coordinator of Test Development, Research and Assessment, Michigan Department of Education, Lansing, Michigan, telephone interview, September 1980.

[46]Michigan Department of Education, The Common Goals of Michigan Education (Lansing: Michigan Department of Education, 1973), p. 5.

> The minimal skill performance objectives for these areas were developed under the direction of staff from the Instructional Specialist Program of the General Education Services, and with the help of committees of Michigan educators and citizens. The State Board received and approved each set of objectives. These performance objectives do not cover all skills in each area but are, instead, minimal skill objectives which most students are expected to attain.[47]

Each objective is measured by a set of five items except for tenth grade mathematics which uses four. In reading, the tenth grade test measures fifteen objectives, and in mathematics, the test measures forty objectives. It is important to note that the tests were not designed to evaluate reading attainment levels relative to mathematics attainment levels or vice versa.

The MEAP handbook states how its tests differ from those that are norm-referenced:

> MEAP tests do not provide the same kinds of information as norm-referenced tests. Norm--referenced test information is usually used to determine how a student is doing relative to the performance of other students on the same test. MEAP tests provide information on whether or not a student has attained a specific skill or performance objective.[48]

Thus, it is obvious that MEAP provides information which is used in the evaluation of education. The State Department

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[47]Caswell, "A Review of the Michigan Educational Assessment Program (MEAP)," p. 2.

[48]Michigan Department of Education, Michigan Educational Assessment Program Handbook 1979-80, p. 12.

of Education finds MEAP useful to plan programs, to evaluate districts, and to improve instruction at the local level.

Evaluation of the System

"Beyond credibility and competition for scarce resources, good educational programming simply requires continual evaluation and feedback."[49] This notion is basically what is behind the Contenders Report of 1978 which details the perceived inadequacy of secondary vocational education opportunities in Michigan.[50]

The Contenders Report is but one example of frustration over conflicting perceptions of what the goals of vocational education should be. Further, unless a system exists that holds the larger system accountable for its outputs, confusion will reign. Both reports, The Common Goals of Michigan Education and the State Plan for Vocational Education in Michigan, state the goals for general education and vocational education. Concerned groups, which form out of frustration at the perceived lack of goal attainment, have legitimate claims when they assess shortcomings in the system. Reports such as that of the Contenders are biased when they are addressing an emotional issue reported upon by persons

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[49]Ralph C. Wenrich and J. William Wenrich, Leadership in Administration of Vocational and Technical Education (Columbus: Charles E. Merrill Publishing Co., 1974), p. 261.

[50]The Contenders, "The Inequality of Vocational Education Opportunities for Michigan High School Students."

involved in the issue. Wenrich and Wenrich caution about evaluation that can be misunderstood because of understandable bias. "One hinderance to rational decision making is that the way a problem is defined tends to determine the way in which it is resolved."[51] The full title of the Contenders Report seems to present the bias of the authors, thus, subtracting deserved credibility--"The Inequality of Vocational Education Opportunities for Michigan High School Students--A Research Report." Even though such research is well intended and apparently accurate, it does not instill confidence when the emotionalism of the writers is evident.

This researcher's purpose is to describe existing factors and to let that act as an input evaluation for decision and policy makers. A problem in vocational education is the lack of relevant research upon which to draw for decision making. MEAP data is one tool that has use in evaluating vocational programs. This study is but a small portion of the possible systems which exist for comparing and contrasting programs and systems of vocational delivery. Most are prohibitive in scope, accessibility to data, and cost for individual academic researchers. However, given a matrix for evaluation at the highest levels, both large research projects and small individual research efforts can and do

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[51]Wenrich and Wenrich, Leadership in Administration of Vocational and Technical Education, p. 107.

feed into the system. Daniel Stufflebeam indicates this when defining educational evaluation as, "the process of delineating, obtaining and providing useful information for judging decision alternatives."[52] Wenrich and Wenrich agree that evaluation aids decision making.

> The major purpose of evaluation is to improve institutional performance. It must assist the decision maker in ascertaining whether or not program objectives have been achieved, and even whether or not they should be changed."[53]

A complete treatise on evaluation at this point would be inappropriate, but some discussion of evaluation is necessary to establish a framework within which this research can be useful. According to Stufflebeam, the four categories of evaluation in education are context, input, process, and product (CIPP model). According to Ralph C. Wenrich, Professor of Education, University of Michigan, this model is quite applicable to vocational education and makes use of the natural components of vocational training.[54] Context has to do with the structure of overall educational planning. This can be at any level. Input has to do with "things" such as program and course content. Process relates to the

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[52]Phi Delta Kappa National Study Committee on Evaluation. Educational Evaluation and Decision Making, p. 218.

[53]Wenrich and Wenrich, Leadership in Administration of Vocational and Technical Education, p. 262.

[54]Ralph C. Wenrich, reply to question by this writer in class (Administration of Vocational Education), University of Michigan, 1975.

action that takes place in learning: student services, teacher performance, and operation of the classroom. Product is associated with the outputs of the system, i.e., the student who has mastery of the objectives and is employable. Product is easy for vocational education to assess with simple follow-up studies.[55] Wenrich and Wenrich detail criticism of educational evaluation: "It has too often focused primarily on process and input, and only secondarily on context and product. As a result, educational goals and objectives are frequently not revised to reflect society's priorities, ..."[56] This research takes direct aim on context using product factors as the means to the end.

Summary

The theme of this chapter is that of emphasizing a concern of a few vocational leaders, namely that of the possibility and potential of different types of vocational schools to contribute to social inequalities. This chapter has been used to structure the above concern by developing each of its components as parts of that structure. The review of the vocational delivery systems was designed to provide a basis for the structure with student characteristics

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[55]Phi Delta Kappa National Study Committee on Evaluation, Educational Evaluation and Decision Making, p. 218.

[56]Wenrich and Wenrich, Leadership in Administration of Vocational and Technical Education, p. 262.

being built upon that. The system evaluation review provided a completion of the theme with an emphasis on renewal and maintenance of the structure through continuous updating.

CHAPTER III

METHODOLOGY

This chapter will detail the major tasks in conducting this study: (1) defining the population and study sample, (2) describing the operational measures, (3) identifying the research hypothesis to be tested, (4) describing the design and analysis of the study, and (5) review of Chapter III.

Population and Sample

In order to fulfill the specifications of the "ideal" district, Michigan counties selected to participate in this study had to share the following characteristics:

1. The counties or Career Education Planning Districts (CEPD) must have both a local vocational education delivery system and an area skill center.
2. A "mix" of urban and rural counties or Career Education Planning Districts must appear in the group.

It was determined that eight Career Education Planning Districts clearly function with the dual delivery system. Of the eight districts personally contacted, only four agreed to participate in the study.

The population of this study included all 1979-80 eleventh grade students who were enrolled in wage-earning vocational programs in five Michigan counties and whose school had administered the MEAP test the previous year.[1] An alphabetical list of the students was obtained from each of the four Career Education Planning Districts. Using these lists, a systematic sample was drawn from each of the Career Education Planning Districts of students whose home high school participated in the Michigan Educational Assessment Program. Every third name on each list was chosen, with the starting name being determined randomly from the first three names on the list. This procedure resulted in a sample of six hundred seventy--nine students, four hundred eighty-two of whom were determined to have been participants in the MEAP test when they were in the tenth grade. Of these, two hundred seventeen were enrolled in area center schools and two hundred sixty-five were enrolled in vocational programs in

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[1]For statistical purposes, two counties are considered as one unit because they comprise one Career Education Planning District (CEPD).

local comprehensive high schools. It was by chance that the numbers in each group were nearly equal.

Operational Measures

The data used for this study was collected by the MDE Evaluation and Assessment Services and the V-TES Vocational Education Data System (VEDS). The MEAP test tests fourth, seventh and tenth grade students on an annual, statewide basis, concentrating on reading and mathematics. The battery of tests are administered in September and October. The tenth grade test measures fifteen reading and forty mathematics objectives. Each objective is measured by a set of five items. The MEAP test was established in 1969 and constantly reviewed by advisory panels, committees of educators and other experts to ensure that the tests and objectives are valid. The data on achievement pertaining to the Michigan Educational Assessment Program was obtained in the following manner:

1. Districts which participated in the testing were identified (1978-79 was the last year that participation was voluntary) within the selected counties.
2. CEPD vocational-technical specialists in each CEPD were enlisted to make all vocational students' names available for the sampling.

procedure. Of the eight CEPD's identified as having the criteria necessary for this study, four refused to cooperate for reasons such as lack of staff, legal restrictions, or not interested. This sample was conducted on location in the districts concerned,

3. Only the code numbers with the Occupational Education Program number for each student was retained by this researcher. The student names were coded and sent to Westinghouse Datascore Systems, Westinghouse Learning Center, to access the test result data stored in computer there by the MDE Evaluation and Assessment Services. Westinghouse Datascore Systems personnel placed the code numbers on the data and then removed the names from the data supplied to this researcher. This was done to comply with the Right To Privacy Act.[2]

Because this study is a fixed effects study, concerned with descriptive information, it is essential to describe the demographics. Demographic data was obtained with the cooperation of the MDE and V-TES. The data concerning race, limited English speaking ability, and academic disadvantage

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[2]Family Educational Rights and Privacy Act, Statutes at Large, LXXXVIII, sec. 484 (1974).

was collected by the MDE and V-TES. The data is presented in the next chapter. The timing of the data collection is important with respect to the Vocational Education Data System information (see Appendix, Table A.4, for sample data collection format). The data was not available at the MDE, V-TES until July, 1980, as reporting by the individual districts is accomplished at the end of the school year 1979-80.

Hypotheses to be Tested

The intent of this investigation was to identify, analyze and compare characteristics of students attending area skill centers with students enrolled in local comprehensive high school vocational programs. The following null hypotheses were formulated:

1. There is no difference by sex on reading and mathematics scores within the population of students.
2. There is no difference by school type, i.e., local programs and area centers, for the population of students on reading and mathematics scores.
3. There is no difference by CEPD, i.e., county, on reading and mathematics scores within the population of students.

Research Questions

The following research questions are asked:

1. Who are the two types of vocational delivery systems serving?
2. Which programs are the students of the population of this study enrolled in and in what numbers?
3. Which programs are found to predominate in area centers and local school vocational systems?

Design and Analysis

Multivariate analysis of variance (MANOVA) was performed using the statistical package for the social sciences (SPSS) on the Control Data Corporation (CDC) 750 computer at Michigan State University. The MANOVA was used because this study has two interval level dependent variables and three qualitative independent variables using the .05 level of significance for the F tests. Multivariate F tests were used to determine if there was an overall difference in achievement level, mathematics and reading combined, or if an overall difference in achievement level existed between the school types. When overall significance was determined, then the univariate F test for mathematics and reading scores were examined separately to determine if a difference occurred on both types of academic achievement, or if only one of them accounted for the significance.

Summary

Included in this chapter on methodology are details on the population, sample, operational measures, hypotheses to be tested, research questions, and the design and analysis. Emphasis was given to the selection of individuals and counties in the population and sample sections. Under operational measures, the point of confidentiality of the subjects' MEAP results was emphasized by detailing this researcher's careful collection of data. Also mentioned was the method of obtaining MDE, V-TES data.

CHAPTER IV

ANALYSIS AND PRESENTATION OF DATA

Introduction

This chapter is a report on the analysis of the hypotheses stated in the previous chapter. The organization of this chapter is as follows:

1. Test of Hypotheses.
2. Research Questions.
3. Summary.

Test of Hypotheses

There are three hypotheses in this investigation and they are described in this section. The MANOVA used to analyze the two interval level dependent variables, of MEAP test reading scores and mathematics scores, and the three qualitative independent variables of sex, CEPD and school type.

The three null hypotheses were:

1. H_0: There is no difference by sex on reading and mathematics scores within the population of students.
2. H_0: There is no difference by school type, i.e., local programs and area centers, for the population of students on reading and mathematics scores.

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2. A "mix" of urban and rural counties or Career Education Planning Districts must appear in the group.

It was determined that eight Career Education Planning Districts clearly function with the dual delivery system. Of the eight districts personally contacted, only four agreed to participate in the study.

The population of this study included all 1979-80 eleventh grade students who were enrolled in wage-earning vocational programs in five Michigan counties and whose school had administered the MEAP test the previous year.[1] An alphabetical list of the students was obtained from each of the four Career Education Planning Districts. Using these lists, a systematic sample was drawn from each of the Career Education Planning Districts of students whose home high school participated in the Michigan Educational Assessment Program. Every third name on each list was chosen, with the starting name being determined randomly from the first three names on the list. This procedure resulted in a sample of six hundred seventy--nine students, four hundred eighty-two of whom were determined to have been participants in the MEAP test when they were in the tenth grade. Of these, two hundred seventeen were enrolled in area center schools and two hundred sixty-five were enrolled in vocational programs in

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[1]For statistical purposes, two counties are considered as one unit because they comprise one Career Education Planning District (CEPD).

local comprehensive high schools. It was by chance that the numbers in each group were nearly equal.

Operational Measures

The data used for this study was collected by the MDE Evaluation and Assessment Services and the V-TES Vocational Education Data System (VEDS). The MEAP test tests fourth, seventh and tenth grade students on an annual, statewide basis, concentrating on reading and mathematics. The battery of tests are administered in September and October. The tenth grade test measures fifteen reading and forty mathematics objectives. Each objective is measured by a set of five items. The MEAP test was established in 1969 and constantly reviewed by advisory panels, committees of educators and other experts to ensure that the tests and objectives are valid. The data on achievement pertaining to the Michigan Educational Assessment Program was obtained in the following manner:

1. Districts which participated in the testing were identified (1978-79 was the last year that participation was voluntary) within the selected counties.
2. CEPD vocational-technical specialists in each CEPD were enlisted to make all vocational students' names available for the sampling.

procedure. Of the eight CEPD's identified as having the criteria necessary for this study, four refused to cooperate for reasons such as lack of staff, legal restrictions, or not interested. This sample was conducted on location in the districts concerned,

3. Only the code numbers with the Occupational Education Program number for each student was retained by this researcher. The student names were coded and sent to Westinghouse Datascore Systems, Westinghouse Learning Center, to access the test result data stored in computer there by the MDE Evaluation and Assessment Services. Westinghouse Datascore Systems personnel placed the code numbers on the data and then removed the names from the data supplied to this researcher. This was done to comply with the Right To Privacy Act.[2]

Because this study is a fixed effects study, concerned with descriptive information, it is essential to describe the demographics. Demographic data was obtained with the cooperation of the MDE and V-TES. The data concerning race, limited English speaking ability, and academic disadvantage

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[2]Family Educational Rights and Privacy Act, Statutes at Large, LXXXVIII, sec. 484 (1974).

was collected by the MDE and V-TES. The data is presented in the next chapter. The timing of the data collection is important with respect to the Vocational Education Data System information (see Appendix, Table A.4, for sample data collection format). The data was not available at the MDE, V-TES until July, 1980, as reporting by the individual districts is accomplished at the end of the school year 1979-80.

Hypotheses to be Tested

The intent of this investigation was to identify, analyze and compare characteristics of students attending area skill centers with students enrolled in local comprehensive high school vocational programs. The following null hypotheses were formulated:

1. There is no difference by sex on reading and mathematics scores within the population of students.
2. There is no difference by school type, i.e., local programs and area centers, for the population of students on reading and mathematics scores.
3. There is no difference by CEPD, i.e., county, on reading and mathematics scores within the population of students.

Research Questions

The following research questions are asked:

1. Who are the two types of vocational delivery systems serving?
2. Which programs are the students of the population of this study enrolled in and in what numbers?
3. Which programs are found to predominate in area centers and local school vocational systems?

Design and Analysis

Multivariate analysis of variance (MANOVA) was performed using the statistical package for the social sciences (SPSS) on the Control Data Corporation (CDC) 750 computer at Michigan State University. The MANOVA was used because this study has two interval level dependent variables and three qualitative independent variables using the .05 level of significance for the F tests. Multivariate F tests were used to determine if there was an overall difference in achievement level, mathematics and reading combined, or if an overall difference in achievement level existed between the school types. When overall significance was determined, then the univariate F test for mathematics and reading scores were examined separately to determine if a difference occurred on both types of academic achievement, or if only one of them accounted for the significance.

Summary

Included in this chapter on methodology are details on the population, sample, operational measures, hypotheses to be tested, research questions, and the design and analysis. Emphasis was given to the selection of individuals and counties in the population and sample sections. Under operational measures, the point of confidentiality of the subjects' MEAP results was emphasized by detailing this researcher's careful collection of data. Also mentioned was the method of obtaining MDE, V-TES data.

CHAPTER IV

ANALYSIS AND PRESENTATION OF DATA

Introduction

This chapter is a report on the analysis of the hypotheses stated in the previous chapter. The organization of this chapter is as follows:

1. Test of Hypotheses.
2. Research Questions.
3. Summary.

Test of Hypotheses

There are three hypotheses in this investigation and they are described in this section. The MANOVA used to analyze the two interval level dependent variables, of MEAP test reading scores and mathematics scores, and the three qualitative independent variables of sex, CEPD and school type.

The three null hypotheses were:

1. H_0: There is no difference by sex on reading and mathematics scores within the population of students.
2. H_0: There is no difference by school type, i.e., local programs and area centers, for the population of students on reading and mathematics scores.

3. H_0: There is no difference by CEPD, i.e., county, on reading and mathematics scores within the population of students.

Because this study had the characteristic of unequal cell sizes, i.e., unbalanced design, the three hypotheses could not be tested independently. In addition, it was necessary to determine that there were no significant interactions between any of the three independent variables before it was possible to test for significant effects for any of them individually. A three-way test of interactions for CEPD, sex, and school type provided an F equal to 0.536 which was not significant (p=.781). The tests for two-way interactions are summarized as follows:

Sex by school type: F value = 0.029, significance of F = 0.971.

CEPD by school type: F value = 1.093, significance of F = 0.364.

CEPD by sex: F value = 0.082, significance of F = 0.567.

All of the tests for interaction were non-significant at the .05 level of significance, therefore, it was possible to look at tests of significance for main effects.

There were three hypotheses in this investigation that could be tested. The independent variables were: sex; type of vocational program, i.e., area center or local high school; and CEPD. The dependent variable was student achievement on the MEAP reading and mathematics test.

Because the investigation was of unbalanced design, due to unequal cell sizes, the tests for various main effects were not independent of one another. Therefore, each main effect being tested could be examined only if the preceding test, in the ordering, was determined to be non-significant.

In addition, multivariate F tests were performed to determine if there was an overall difference in achievement level. Only if the multivariate test was significant were univariate tests for reading and mathematics scores examined separately. This was done to control the overall error rate (α = .05).

Hypothesis 1

H_0: There is no difference by sex on reading and mathematics scores within the population of students.

When controlling for CEPD and school type, it was found that there was no significant effect for sex: $F = 1.6$, $p < .20$, $df = 2,445$. Therefore, the overall multivariate F tests revealed that there was no difference in academic achievement by sex. This suggests that a student's sex is not a factor in mathematics and reading achievement in the two types of vocational programs studied.

Hypothesis 2

H_0: There is no difference by school type, i.e., local programs and area centers, for the population of students on reading and mathematics scores.

When controlling for CEPD and sex, it was found that there was a significant effect for school type: $F=7.60$, $p<.0005$, $df=2,445$, thus, there is a difference in academic achievement by school type. Therefore, the data leads to rejection of the null hypothesis. Figures 4.1 and 4.2 are graphic representation of this test.

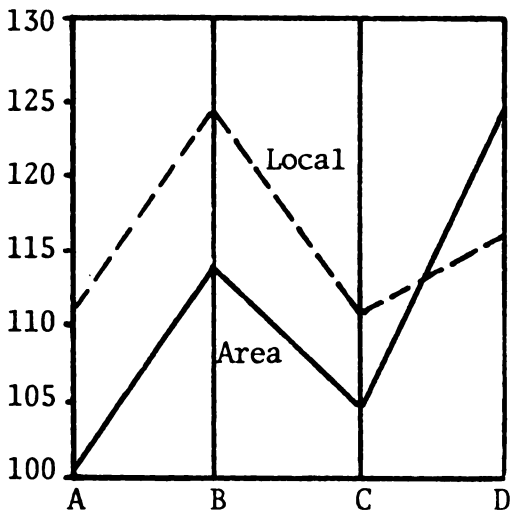

Fig. 4.1. Interactive effect for CEPD by school type for mathematics.

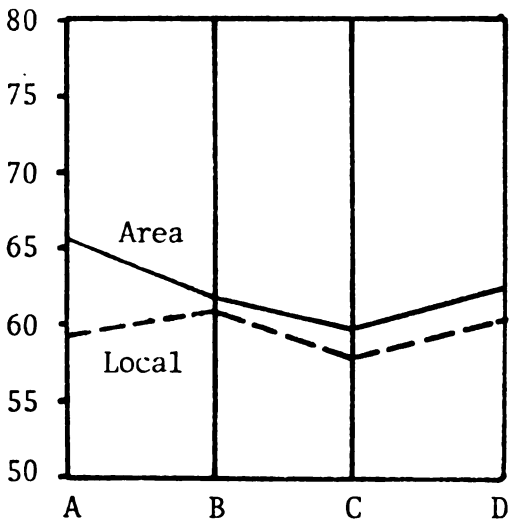

Fig. 4.2. Interactive effect for CEPD by school type for reading.

Further analysis of the data using the univariate F tests revealed that there was a difference on reading scores between school types, $F=7.05$, $p<.008$, $df=1,446$, and a

difference on mathematics scores between school types, $F=4.77$, $p<.03$, $df=1,446$. This shows that a difference occurs between the two types of schools on both the reading and mathematics achievement factors.

Hypothesis 3

H_0: There is no difference by CEPD, i.e., county, on reading and mathematics scores within the population of students.

When controlling for sex and school type, it was found that there was a significant effect for CEPD: $F=3.84$, $p<.009$, $df=6,890$, thus, a difference in academic achievement by CEPD. Therefore, the data leads to rejection of the null hypothesis. Figures 4.3 and 4.4 are graphic representation of the interaction effect for this test.

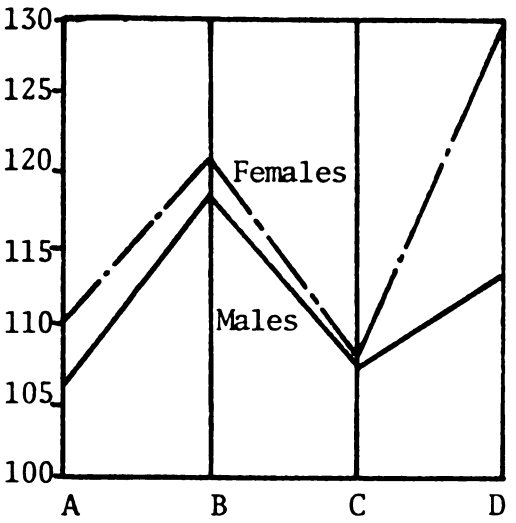

Fig. 4.3. Interactive effect for CEPD by sex for mathematics.

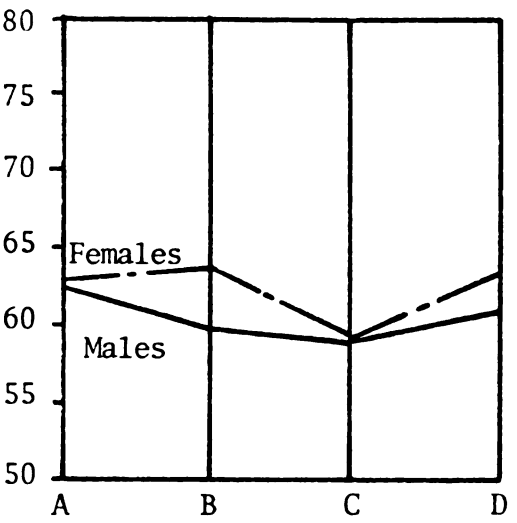

Fig. 4.4. Interactive effect for CEPD by sex for reading.

Further analysis of the data using the univariate F tests showed that there was a difference on mathematics between CEPDs, $F=5.92$, $p < .0006$, $df=3,446$, but no significant difference on reading scores between CEPDs, so that this overall difference by CEPD was due to the difference in mathematics achievement and not reading achievement.

The sample of this study consisted of approximately equal numbers of boys and girls in a total population of four hundred eighty-two. The number of boys in area center programs was nearly equal to that of boys in local vocational programs, while there were about one-half as many girls in area centers as in local vocational programs. The largest number of boys were concentrated in trade and industrial courses while the girls were concentrated in office education and distributive education courses. A further description of the sample can be seen in Tables A.1, A.2, and A.3 of the Appendix.

Of the schools in the population, it was found that sixty-two programs or courses were offered and that fifty--three of these were represented by students in the sample.

Research Questions

The three research questions are examined on the following page. The MDE, V-TES Secondary Vocational Enrollment and Termination Report data is used to develop the answers to the questions.

1. Who are the two types of vocational delivery systems serving?

From the data in Table 4.1 on the following page, it is obvious that the majority of students served by secondary vocational education in the districts studied are white. This finding coincides with the actual demographics for the population as a whole in the regions in which the districts of this study are located. Computed from the Michigan Employment Security Commission, Affirmative Action Information Report,[1] the average percentage of sixteen years and over white for the Michigan counties of this study was 95%. For blacks, it was 4.25%, and for Hispanic or Spanish Americans, it was 1.4% of the total population of those counties.

The findings of this study show the following percentages of racial groups in vocational education within the area centers and local school programs: white, 93.2%; black, 4.4%; Hispanic, 1.7%; others, .6%.

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[1]Michigan Employment Security Commission, Equal Opportunity Division, Affirmative Action Information Report (Detroit: Michigan Employment Security Commission, spring 1980), p. 17.

Table 4.1
Demographic Data Summary of the Population of This Study by CEPD, 11th & 12th Grades 1978-1979

RACE & SEX	% OF TOTAL POP.	% within groups	CEPD A				CEPD B				CEPD C				CEPD D				TOTALS			
			Area		Local		Area		Local		Area		Local		Area		Local		Area		Local	
			n's	%	n's	%	n's	%	n's	%	n's	%	n's	%	n's	%	n's	%	n's	%	n's	%
Male		54.80	829	88	111	12	1460	66	737	34	740	64	425	36	96	28	253	72	3215	67.8	1526	32.2
White	93.20																					
Female		38.40	586	67	294	33	832	61	533	39	393	52	358	48	206	63	122	37	2017	60.6	1307	39.4
Male		0.25	5	55	4	45	2	25	6	75	3	75	1	25	1	100	0		11	50	11	50
Am. Indian	0.50																					
Female		0.25	6	54	5	46	2	33	4	67	1	100	0		4	100	0		13	59	9	41
Male		0.90	8	62	5	38	8	42	11	58	17	51	16	49	6	46	7	54	39	50	39	50
Hispanic	1.70																					
Female		0.82	5	41	7	59	13	50	13	50	9	39	14	61	2	20	8	80	29	41	42	59
Male		2.00	62	95	3	5	61	56	47	44	1	100	0		0		0		124	71	50	29
Black	4.40																					
Female		2.40	59	98	1	2	63	45	77	55	3	75	1	25	2	100	0		127	62	79	38
Male		0.10	1	50	1	50	6	100	0		1	100	0		0		0		8	89	1	11
Asian	0.11																					
Female		0.01	0		1	100	1	100	0		2	100	0		0		0		3	75	1	25
Σ n's	100%		1561		432		2448		1428		1170		815		317		383		5586	54.8	3065	45.2
LESA		0.6	2	8	23	92	4	100	0		3	25	9	75	0		9	100	9	21.9	41	78.1
Academ. Disadvan.		9.2	142	98	3	2	32	33	64	67	333	75	112	25	30	35	84	65	537	51.1	263	48.9

Source: Michigan Department of Education Vocational-Technical Education Service Management Information and Finance Unit, Secondary Vocational Enrollment and Termination Report for the School Year Ending 06-30-80, (Lansing: MDE,V-TES), p. 1424

Table 4.2

Race Group Data for Four Michigan Counties; Total Population Over Sixteen Years and Secondary School Vocational Students

Counties A,B,C,D	Total	Race			
		White	Black	Hispanic	Other
Total Population 16 Years & Over	101.2[a]	95%	4.2%	1.4%	.6%
11th & 12th Grade Vocational Students	99.9[b]	93.2%	4.4%	1.7%	.6%

[a]MESC data does not total 100%.

[b]Sum total varies from 100% due to arithmetic rounding.

Further analysis of the data reveals that of the 5,586 area center students, 93.6% were white; 4.4% were black, 1.2% were Hispanic, and 0.6% were Asian and American Indian. Of the 3,065 local school vocational students; 92.4% were white, 4.2% were black, 2.6% were Hispanic, and 0.7% were Asian and American Indian. The data reveal that of the 8,651 vocational students in the population of this study, 0.6% had limited English speaking ability and 9.2% were classified as academically disadvantaged. Among the CEPDs the range of percent of academic disadvantaged is from a low of 0.7 in one CEPD's local schools to that of 13.7% and 28% in another's local programs and area center.

Of the 8,651 students in the population of this study, 58% were males and 42% were females. Of these students the percentage breakdown for the area centers was 61% male and 39% female, while that for the local programs was 53%

male and 47% female. From Table 4.1 it can be seen that the area centers enroll 67.8% of the white males (locals = 32.2%), 71% of the black males (locals = 29%), 50% each of the Hispanic and American Indian males and 89% of the Asian males (locals = 11%). Also, it can be observed that the area centers enroll 60.6% of the white females (local = 39.4), 62% black females (locals = 38%), 41% of the Hispanic females (local = 59%), 59% of the American Indian females (local = 41%), and 75% Asian females (local = 25%).

2. Which programs are the students of the population of this study enrolled in and in what numbers?

The programs in Table 4.3 on the following page represent six major areas of occupational preparation. The usual representation is five divisions; however, commercial food preparation was observed to be rather large in its own right and listed herein as an autonomous area. Several occupational preparation courses are offered by individual districts which are relatively unique to their situation, and in collapsing the data for representation in chart form, it was felt inappropriate by this researcher to include them under the usual groupings; thus, they were not included. The dropping of some programs or courses from consideration accounts for the grand total discrepancies from Table 4.1 to Table 4.3, a difference of four hundred seventy-one students out of the population of 8,651.

Table 4.3
Demographic Data Summary for the Population
of This Study, by Program
11th & 12th Grades
1979-1980

Program And School Type		American Indian		Asian		Black		Latino Hispanic		White		Row Totals
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Agriculture	Area							2	2	228	163	395
	Local						1	6	5	160	115	287
Distributive Education	Area			2			1		2	48	87	140
	Local					6	5	13	11	316	353	704
Health	Area		3			7	21		7	9	205	252
	Local				1				8	13	100	122
Food	Area		1	1		28	31	3	3	133	427	627
	Local							5	6	26	55	92
Office Education	Area		1				13	2	6	57	300	379
	Local		4		1	1	53	1	20	21	574	675
Trade & Industry	Area	4	2	4	3	75	11	29	4	2415	553	3100
	Local	1		1		52	28	12	9	1054	250	1407
AREA TOTALS		4	7	7	3	110	77	36	24	2890	1735	4893
LOCAL TOTALS		1	4	1	2	59	87	37	59	1590	1447	3287
TOTALS		5	11	8	5	169	164	73	83	4480	3182	8180

Source: Michigan Department of Education Vocational-Technical Education Service Management Information and Finance Unit, Secondary Vocational Enrollment and Termination Report for the School Year Ending 06-30-80, (Lansing: MDE,V-TES), p. 1424.

From Table 4.3 it was found that 59.8% of the 8,180 students were enrolled in area centers and the remaining 40.2% in local vocational programs. A further analysis of those students found the following percent of breakdown for each program.

Table 4.4
Percentage of Students in Each Occupational Program by School Type.

Program	Area Center	Local School	Total
Agriculture	4.8	3.5	8.3
Distributive Education	1.7	8.6	10.3
Health	3.1	1.5	4.6
Food	7.7	0.01	7.7
Office Education	4.6	8.3	12.9
Trade & Industry	37.9	17.2	55.1
			98.9%

In computing from the data in Table 4.3 it was found that the racial minorities, the three hundred thirty-three blacks, were concentrated in the following school type and program areas: area center trade and industry, 25%; local school trade and industry, 24%; area center food programs, 17%; and local office education, 16%. In observing all the minority enrollment data, it is seen that the school type and programs with the largest minority enrollments were (1) local distributive education, (2) area center foods, (3) local office education, and (4) both area center and local trade and industry programs. Of the 7,662 white

students it was found that area center trade and industry programs contained the highest percentage with 38.7%. The second highest program population for whites was local trade and industry with 17.6%. The remaining programs have a fairly even distribution in the 1.5% to 8.7% range of the white student population.

The program area percentage breakdown, Table 4.5 on the following page, for the fifty-nine LESA students revealed that 13.6% were enrolled in area centers and 86.3% in local school vocational programs; and 47.4% of the LESA students were found to be enrolled in local office education programs as compared to 8.3% of the 8,180 population of this study being enrolled in local office education programs.

The reverse situation was observed for the academically disadvantaged population and the LESA student population within the two delivery systems. Of the eight hundred forty-seven academically disadvantaged, 63.9% were enrolled in area centers and 35.75% in local school vocational programs. The distribution of academically disadvantaged tended to follow the distribution of the 8,180 population.. The main exceptions were local distributive education enrolling 2.4% versus local distributive education accounting for 8.6% of the population. The other program area exhibiting a large discrepancy in the percent of academically disadvantaged to the percent of the population in that program was local office education with 2.7% versus 8.25%.

Table 4.5

Percentage of Limited English Speaking Ability Students and Academically Disadvantaged Students in Each Occupational Program by School Type.

Program And School Type		LESA	% LESA	Acad. Disad.	% Acad. Disad.	% of Pop. of 8180 in ea. program
Agriculture	Area	0	0	4	5.5	4.8
	Local	1	1.7	36	4.25	3.5
Distributive Education	Area	0	0	16	1.8	1.7
	Local	4	6.7	21	2.4	8.6
Health	Area	5	8.5	45	5.3	3.1
	Local	7	11.9	31	3.7	1.5
Food	Area	0	0	61	7.2	7.7
	Local	4	6.7	12	1.4	0.01
Office Education	Area	1	1.7	46	5.4	4.6
	Local	28	47.4	23	2.7	8.3
Trade & Industry	Area	2	3.4	328	38.7	37.9
	Local	7	11.9	181	21.3	17.2
AREA TOTALS		8	13.6	543	63.9	
LOCAL TOTALS		51	86.3	304	35.8	
TOTALS		59	99.9	847	99.7	

Sum total varies from 100% due to arithmetic rounding.

3. Which programs are found to predominate in local school vocational systems?

From the data in Table 4.3 it is observed that the predominant programs, based on enrollment, in the local school vocational offerings are trade and industry offerings with 17.2%, office education with 8.25%, and distributive education with 8.6%. By comparison, it is seen that the predominant program area for area centers is trade and industry with 37.9% of the population of this study.

Summary

This chapter contained the analysis of the three hypotheses. The hypotheses were tested to determine if difference exists between academic achievement and sex, type of vocational school, and CEPD. Also examined and described in this chapter were the demographic data to answer three descriptive reaearch questions. The demographic data also describe the population for those who may wish to approximate this study to their own test of hypothesis situation. The approximation is important because this is a fixed effects study and cannot be statistically inferred to another population.[2]

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[2]Jerome Cornfield and John W. Tukey, "Average Values of Mean Squares in Factorials," Annals of Mathematical Statistics 27: 907-949.

CHAPTER V

CONCLUDING DISCUSSION

Summary

In any "system" a process for its evaluation must be inherent in its efforts to maintain and improve its mission. This research attempted to provide additional data and information for an ongoing evaluation of vocational education in Michigan. The concept of social stratification as a societal or organizational means to an end was raised, as it applies to whether or not vocational education and its sub-parts contribute to that stratification.

This study was designed to identify, analyze, and compare students attending area skill centers with those attending local comprehensive high school vocational programs. The student characteristics under study were: (1) sex; (2) academic achievement, i.e., reading and mathematics; and (3) demographic and program characteristics. The descriptive data included race, limited English speaking ability and academic disadvantage of vocational students in the population of four Michigan Career Education Planning Districts. The sample was drawn from 8,651 1979-80 juniors

enrolled in vocational education, in area skill centers and local comprehensive high school vocational programs who took the MEAP test in 1978-79. The MEAP test is an annual, statewide, objective-referenced, competency examination. The sample consisted of four hundred eighty-two students. Three testable hypotheses were examined using MANOVA to analyze the two interval level dependent variables, of MEAP test reading scores and mathematics scores and the three qualitative independent variables of sex, CEPD, and type of vocational school. MANOVA was performed using the Statistical Package for the Social Sciences (SPSS) on the Control Data Corporation (CDC) 750 computer.

Discussion of Major Findings

The findings are based on the results of the analysis of the hypotheses previously stated in Chapter IV. Also, the basis of the data and limitations cited, observations about the population and sample are discussed.

Hypothesis Observations

The observations are as follows:

1. Sex is not a factor with regard to achievement of vocational students in mathematics and reading.
2. There is a difference in academic achievement between area skill centers and local vocational

programs. The data showed that the scores were higher for local schools on mathematics and higher for area centers on reading.

3. There is a difference in academic achievement between the four CEPDs. The data revealed that there was no difference between CEPDs on reading scores but that a difference exists on mathematics achievement.
4. As this researcher compiled the raw data, it was observed that most of the females in office education scored well on reading and mathematics tested by MEAP. Tables A.2 and A.3 of the Appendix show that office education, with a proportionately large enrollment, is primarily a local school offering and not an area center offering; thus, giving the impression that local school vocational students' mathematics and reading achievement is near that of area vocational centers. This may have not been the case if equal cell sizes had been available for the analysis.

Population Observations

The first observation that the data revealed was that although the majority of students in vocational education programs were white, the actual percentage coincided nearly

exactly with the percentage in the general populations of the regions studied. The same coinsidence of percentages occurred in the other racial groups. The data from the analysis of question one, which asked who the two vocational systems serve, further found that the percentage of each racial group in each delivery system was nearly the same as that of the general population. Also, the data revealed that of the total population of this study, there were 16% more males in vocational education than females. This, however, was not uniform between the two delivery systems, as the area centers enrolled 22% more males than females versus a 6% difference in favor of the males for the local programs. Another finding was that the area centers enroll a much higher percentage of Asians, blacks, and whites than the local schools.

The major findings associated with the second research question inquiring as to the programs the students enroll in revealed that area centers account for twice as many trade and industry students as local schools and that food preparation programs are nearly exclusively the domain of area centers. Also, it was seen that distributive education and office education were much more likely to be studied by the vocational students in their local or home high schools. With respect to the program selection by minority groups it was found that in the local schools, distributive education and office education were most often found to have a higher

percentage of minorities than other programs. The minority students were disproportionately represented in the foods programs in area centers with respect to minorities in other programs, and trade and industry programs in both area and local schools followed the above pattern of a concentration of minorities. The trade and industry programs in both systems were most popular with the white students.

The limited English speaking ability students were found to be enrolled in local schools by a difference of 72.7% and a disproportionate number were found to be enrolled in local office education programs. Interestingly, just the opposite occurred with respect to academically disadvantaged with the area centers enrolling twice as many as local schools. The academically disadvantaged did not tend to be concentrating in any particular program.

In addressing the third research question it was found that the trade and industry programs in both systems enrolled the majority of students.

Implications

This research has established a framework from which further studies in the area of process evaluation can be undertaken. It has been established that few studies have been reported dealing with the characteristics of students in specialized vocational programs. The dearth of previous research and the difficulty in obtaining data for this work

underscores the enormous need for research of this nature. This research shows that opportunities exist to do meaningful process oriented research. It is hoped that this study will encourage others if a ray of light has been shed by this effort. The specific implications of the findings are as follows:

1. Since males and females showed similar achievement characteristics with respect to mathematics and reading, a study should be undertaken to examine occupational program areas to determine if there are differences by sex with respect to the MEAP reading and mathematics results.
2. Because the area center students and local school vocational students exhibited differences in academic achievement, there should be an effort to identify the reason or reasons for the differences and subsequent steps taken to eliminate the differences.
3. There is some evidence that a difference exists between CEPDs on achievement scores as the public is well aware in regards to individual local district differences. Although the state of Michigan is taking steps to correct inequalities between districts, this data emphasizes the need to

identify and correct the difference within and between the sub-systems.

4. As a result of the findings pointing to no difference in racial composition in vocational education as compared to the general population, the implication is that vocational education is doing a good job in relation to affirmative action or equal opportunity emphasis with regards to race.
5. Because the vocational delivery systems show underrepresentation of the female population, the obvious implication is that a greater emphasis on equal opportunity for females must be pursued.
6. Another finding shows that some racial groups are not equally represented in each of the two systems which leads to the conclusion that an effort must be made to determine if program choice by the students accounts for the discrepancy or if it happens for other reasons.
7. With regards to the second research question the implication is that because certain programs have disproportionate concentrations of males or females and certain racial

groups that further investigation should be implemented to determine the reasons.

8. The last implication is made with regard to the fact that the trade and industry programs enroll the majority of students. Since Michigan is an industrial state, it appears that vocational education is fulfilling its responsibility to the industrial sector.

Recommendations

Based upon the results of this study, it is obvious that a great deal of research needs to be done in identifying the characteristics of students in vocational programs. It is hoped that this study can serve as a beginning for further research aimed at assessing who is really being served by vocational education. This research is hardly all inclusive and can only hint at the needs that exist with respect to determining student characteristics. The first need is for an expanded data base on student characteristics including socioeconomic data, class standing, and academic performance. It is suggested that the Secondary Vocational Enrollment and Termination Report, Table A.4, be expanded to meet the aforementioned needs. It is further suggested that the MDE Research and Assessment Department collect some measure of the student socioeconomic status as part of the MEAP. It is this writer's opinion that the following be done.

1. That employees in individual CEPDs, with access to all student records, analyze the characteristics of students in those individual districts.
2. That a study should be undertaken to assess the effect of possible demographic discrepancies as regards apparent different percentages of minorities and females in the overall population with respect to certain vocational programs.
3. That an investigation should be conducted to assess the effect of the type of vocational school on academic achievement.
4. That an investigation should be conducted to assess the effect of the type of vocational school on vocational course achievement.
5. That additional research should be conducted to investigate the effects of socioeconomic status on the differences shown by this study in academic achievement for vocational students.
6. That longitudinal studies involving pre-test and post-test procedures need to be conducted to determine the effects of sex, type of vocational school, race, and socioeconomic status on vocational students in area skill centers and local school vocational programs.

Summary of the Concluding Discussion

The purpose of this investigation was presented and the procedures used in the conduct of the study were summarized in this chapter. The discussion of the major findings was itemized by observation of the hypotheses and observation of the descriptive data concerning the population. The major findings were followed by the implications of this study and the recommendations for further research.

APPENDIX

Table A.1
The Number of Boys and Girls in Each Occupational Program Area by School Type in the Sample of This Study

Program Area	Boys		Girls	
	Area[a]	Local[b]	Area	Local
Agriculture	9	26	2	23
Distributive Education	1	30	4	39
Health Occupations	0	3	9	11
Food Occupations	4	3	10	8
Office Education	3	1	21	63
Trade & Industry	122	55	27	2
Interior Design	0	0	0	1
Child Care	0	0	5	0
Totals by type	137	118	78	147
Totals by sex	257		225	
Total	482			

[a]Area center vocational school

[b]Local comprehensive high school vocational program

Table A.2
Average Means for MEAP Mathematics Test Scores by CEPD for Each School Type for the Sample of This Study

CEPD	Area Ctr. Males & Females	Local Males & Females	Males Area & Local	Females Area & Local
A	100.26	112.56	106.36	111.53
B	114.21	124.26	118.77	121.94
C	104.67	110.23	107.44	107.84
D	124.52	116.00	114.97	128.18
Average Means	110.92	115.76	111.89	117.37

Table A.3
Average Means for MEAP Reading Test Scores by CEPD for Each School Type for the Sample of This Study

CEPD	Area Ctr. Males & Females	Local Males & Females	Males Area & Local	Females Area & Local
A	66.44	59.38	62.35	62.93
B	63.68	62.22	60.55	64.15
C	59.76	57.40	58.50	58.54
D	63.56	60.87	60.95	64.05
Average Means	63.36	59.97	60.59	62.42

Table A.4

VE-4301 SECONDARY VOCATIONAL ENROLLMENT AND TERMINATION REPORT
FOR SCHOOL YEAR ENDING 06-30-79
RETURN BY JULY 2, 1979

MICHIGAN DEPARTMENT OF EDUCATION
VOCATIONAL-TECHNICAL EDUCATION SERVICE
MANAGEMENT INFORMATION AND FINANCE UNIT
BOX 30009, LANSING, MICHIGAN, 48909

DIRECT QUESTIONS REGARDING THIS FORM TO MACK SEMEY
517-373-0600

CEPD 50 FISCAL AGENT:
INSTR. FACIL:

SECTION A - 11TH & 12TH GRADE ONLY

OE CODE, NAME AND PSM		AMER INDIAN MALE (1)	AMER INDIAN FEMALE (2)	ASIAN MALE (3)	ASIAN FEMALE (4)	BLACK MALE (5)	BLACK FEMALE (6)	LATINO OR HISPANIC MALE (7)	LATINO OR HISPANIC FEMALE (8)	WHITE MALE (9)	WHITE FEMALE (10)	COOP (11)	LESA (12)	ACAD DISAD (13)
04,0800 GENERAL MERCHANDISE 09231	1 ENROLLMENT													
	2 COMPLETIONS											OMIT	OMIT	OMIT
	3 LEAVERS											OMIT	OMIT	OMIT
14,9800 STENO/CLERICAL LAB 09230	1 ENROLLMENT													
	2 COMPLETIONS											OMIT	OMIT	OMIT
	3 LEAVERS											OMIT	OMIT	OMIT

SECTION B - 9TH & 10TH GRADE ENROLLMENT

04	DISTRIBUTIVE EDUCATION											OMIT		
14	OFFICE											OMIT		

SECTION C - GRADES 9-12, 09.01 CONSUMER & HOMEMAKING 08166

COURSE	GRADES 9&10	GRADES 11&12												
02 CHILD DEV												OMIT		
03 CLOTH & TEXTILE												OMIT		
04 CONSUMER ED.												OMIT		
05 FAMILY HEALTH												OMIT		
06 FAM RELATIONS												OMIT		
07 FOOD & NUTR												OMIT		
08 HOME MANAGEMENT												OMIT		
09 HOUS & HOME FUR												OMIT		
98 ADVANCED COMP												OMIT		

CAREER EDUCATION PLANNING DISTRICTS

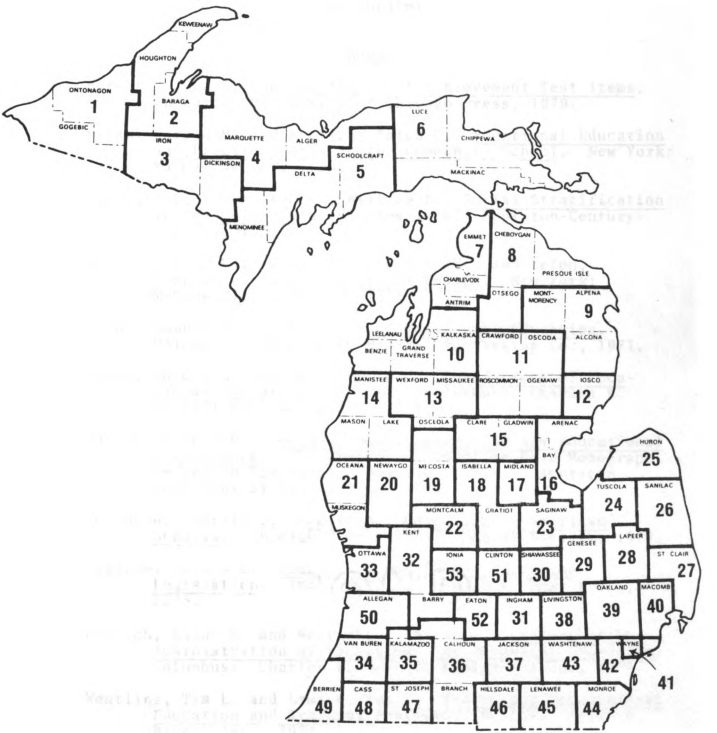

Fig. A.1. Career Education Planning Districts.

Source: Michigan Department of Education, Vocational-Technical Education Service. The Annual and Long Range State Plan for Vocational Education in Michigan (Lansing: Michigan Department of Education, 1979), p. 82.

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