#### ABSTRACT

### AN ASSESSMENT OF SELECTED VARIABLES IN THE SELECTION OF STUDENTS FOR SECONDARY AREA VOCATIONAL PROGRAMS

By

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The purpose of this study was to improve the process of selecting students for participation in secondary area vocational programs through the identification of predictive variables.

The need for the study was emphasized by pointing out the increasing pressures on public education to play a viable role in manpower development. Occupational preparation options are increasing on the secondary level without students having career plans or an adequate background for decision making.

It was theorized that decision making can and should take place at an early age and that measured interests, measured aptitudes and previous grade point averages are of value for career decision making.

The literature reviewed showed a trend toward increased use of testing in career planning at the secondary level. There seemed to be agreement that measured interests, measured aptitudes, and achievement are basic psychological components of the guidance and counseling process. The lack of a process model dealing with the application of testing data was noted. No studies were found that attempted to improve the process of selecting students for participation in secondary area vocational programs through the identification of predictor variables.

A sample of 427 juniors geographically representing Genesee County and now attending the Genesee Area Skill Center was identified. The following five hypotheses were developed in null form to examine the relative value of Ohio Vocational Interest Survey measured interest, Vocational Planning Inventory measured aptitude and previous grade point average in the prediction of success in area vocational programs:

<u>Hypothesis 1</u>: There is no relationship between interests measured with the Ohic Vocational Interest Survey (O.V.I.S.) and grades received in Skill Center courses.

<u>Hypothesis 2</u>: There is no relationship between grades predicted by the Vocational Planning Inventory (V.P.I.) and grades received in Skill Center courses.

<u>Hypothesis 3</u>: There is no relationship between junior high school grade point average (G.P.A.) and grades received in Skill Center courses.

<u>Hypothesis 4</u>: There is no relationship between measured interest and measured aptitude as measured by the O.V.I.S. and the V.P.I. <u>Hypothesis 5</u>: A combination of O.V.I.S. measured interest, V.P.I. measured aptitude, and previous grade point average will not predict grades in Skill Center courses at a higher level of significance than any of these indicators taken singly.

The Pearson Product-Moment method was used to compute coefficients of correlation necessary for testing hypotheses one through four. Least Squares multiple regression was used to compute the multiple regression coefficients necessary for testing hypothesis five.

# Conclusions

Selected O.V.I.S. scale scores, V.P.I. grade predictions, and junior high grade point averages were found to be of value in the prediction of success in some occupational areas. High intercorrelations of variables in some occupational areas tended to reduce the differential predictive value of those variables. Variables which were found to be predictive were generally not predictive in the predetermined relationship patterns identified by counselors and test makers. It was concluded that the interpretation of test results as specified in the tests under consideration in counseling could be worse than having no test data at all. It was shown that predictive variables when used in combination in a multiple regression equation are of more predictive value than any of the variables taken singly.

# Recommendations

Based on the results of this study and conclusions reached it was recommended that an experimental systematized career planning process model be developed and implemented on a trial basis. In this model the handling and interpretation of social facts should be assigned to counselors and the handling and interpretation of psychological facts should be assigned to objective and accountable computer programs. The investment in test materials and processing is far too great to trust to casual interpretations by counselors.

It would be possible for a computer program to allow the inputs from a very large assortment of psychological facts about an individual, match these inputs against established criteria and produce a variety of career plans. Students then, with the assistance of their counselors, could select or deviate from those plans based on social facts brought out by the counselor.

# AN ASSESSMENT OF SELECTED VARIABLES IN THE SELECTION OF STUDENTS FOR SECONDARY AREA VOCATIONAL PROGRAMS

Ву

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# A THESIS

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ii

# TABLE OF CONTENTS

	I	Page
ACKNOWLI	EDGMENTS	ii
LIST OF	TABLES	v
Chapter		
I.	INTRODUCTION	1
	Purpose	1 1 13
	Null HypothesesDefinition of TermsOrganization of the Study	17 18 20
II.	A REVIEW OF RELATED LITERATURE	21
	Introduction	21 21 36
III.	DESIGN AND METHODOLOGY	41
	Introduction	41 41 53 54 57
IV.	ANALYSIS OF THE RESULTS	59
	Hypothesis One	60 82 97 102 105 111

Chapter																			Page
V. :	SUMMARY,	CONCL	usı	ION	S Z	ANI	נכ	REC	CON	1M E	ENI	נאכ	r I C	ONS	5	•	•	•	114
	Intro Summa Concl Recor	oducti ary . Lusion nmenda	on 	ons	• • •	114 114 117 122													
SELECTED	BIBLIOGE	RAPHY	• •	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	125

•

# LIST OF TABLES

TABLE		Page
3.1	DISTRIBUTION OF SAMPLE BY SKILL CENTER PROGRAM	43
3.2	STUDENT GRADE CHANGES 1970-71	52
4.1	COUNSELING RELATIONSHIPS: O.V.I.S., V.P.I., AND OCCUPATIONAL AREA	61
4.2	SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES	64
4.3	COMMERCIAL ART AND O.V.I.S. COEFFICIENTS OF DETERMINATION (r <sup>2</sup> ) FOR SIGNIFICANT CORRELATIONS	65
4.4	SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES	69
4.5	SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES	73
4.6	SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES	78
4.7	SUMMARY OF SIGNIFICANT O.V.I.S. SCALE SCORES AND SKILL CENTER GRADE CORRELATIONS	83
4.8	SKILL CENTER GRADE CORRELATIONS WITH V.P.I. GRADE PREDICTIONS	85
4.9	SKILL CENTER GRADE CORRELATIONS WITH V.P.I. GRADE PREDICTIONS	87
4.10	SKILL CENTER GRADE CORRELATIONS WITH V.P.I. GRADE PREDICTIONS	91
4.11	SKILL CENTER GRADE CORRELATIONS WITH	94

# TABLE

4.12	SUMMARY OF SIGNIFICANT V.P.I. GRADE PREDICTION AND SKILL CENTER GRADE CORRELATIONS	98
4.13	SKILL CENTER GRADE CORRELATIONS WITH JUNIOR HIGH GRADE POINT AVERAGE	101
4.14	O.V.I.S. SCALE SCORES CORRELATIONS WITH V.P.I. CURRICULUM AREAS	103
4.15	O.V.I.S. SCALE SCORES CORRELATIONS WITH V.P.I. CURRICULUM AREAS	104
4.16	O.V.I.S. CLASSIFICATION AND V.P.I. CURRICULUM AREA RELATIONSHIPS	106
4.17	REGRESSION CORRELATIONS FROM COMBINED VARIABLES	109
4.18	HIGHEST CORRELATIONSSINGLE VARIABLES AND COMBINED VARIABLES, BY SKILL CENTER OCCUPATIONAL AREA	112

#### CHAPTER I

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#### INTRODUCTION

#### Purpose

The purpose of this study is to improve the process of selecting students for participation in secondary area vocational programs through the identification of predictive variables. Several selected variables; measured aptitude, measured interest, and previous grade point average taken singly and in combination will be examined in relationship to grades received by students in area vocational programs. If a relationship is found to exist between grades and the variables, it should then be possible to make decisions relative to participation in area vocational programs more efficiently and with some assurance that the students' time and the resources of area vocational programs will be used constructively.

## Need for the Study

The role of public education is rapidly changing in respect to manpower development. There is a trend which recognizes that career preparation must begin at an early

age and that public education must assume the major responsibility for bridging the gap between school and employment. There is a need for public education to prepare students, prior to their leaving school, for assimilation into our socio-economic structure; and a majority of students seek work when they leave school. The changing nature of work now necessitates preparation for jobs as opposed to the labor market of the past which could absorb large numbers of unskilled and untrained workers. A study to clarify this changing role of public education began with the observation that:

In the coming years America will have entering its labor force a larger number of young people than at any time in its past. These young people will be entering a labor market where the need for the unskilled and untrained is at its lowest point. At the same time technology is becoming increasingly complex and the need for skilled manpower has never been higher.<sup>1</sup>

Among the recommendations coming from this study was

the following:

At present, except for office occupations, low proportions of students are enrolled in vocational programs. These programs have little impact on the occupational needs of their communities. Yet the majority of students enter the labor market upon leaving high school. It is apparent that present programs have not been able to serve the needs of either the student or the communities.

<sup>&</sup>lt;sup>1</sup>Jacob J. Kaufman and others, The Role of the Secondary Schools in the Preparation of Youth for Employment, Institute for Research on Human Resources (University Park: Pennsylvania State University, February, 1967), Chapter 12, p. 1.

New programs should be devised that are comprised of occupational clusters and are taught by appropriately prepared teachers in workoriented settings.<sup>1</sup>

An even stronger point of view was expressed by the National Association of School Administrators:

In a technological age, occupational preparation must be a fundamental part of everyone's education and a specific task of the public schools.<sup>2</sup>

The developing emphasis on vocational education was justified by the President's panel of consultants, who summarized their position as follows:

One need not be an economist to see readily that education--especially vocational education-is directly related to the annual total output of goods and services produced by a given labor force. Enhancing the skill of the labor force through education and training will expand output even if technology, capital and labor remain fixed quantities. How important is the factor of education in the economic equation? This guestion cannot be answered definitely. Scholars agree, however, that education was responsible for between one-fourth and one-half of the increased national output achieved by the United States between 1929 and 1956 that could not be attributed to increased utilization of capital and labor.<sup>3</sup>

<sup>1</sup>*Ibid.*, Chapter 13, p. 1.

<sup>2</sup>Grant Venn, Man, Education and Manpower (Washington, D.C.: The American Association of School Administrators, 1970), p. 235.

<sup>3</sup>Economic Report of the President, Annual Report of the Council of Economic Advisors (Washington, D.C.: Government Printing Office, January, 1962, p. 144. The final report of the President's panel of consultants led to the Vocational Education Act of 1963 and the 1968 amendments to that act. This legislation encourages the development of vocational preparation in our secondary comprehensive schools and in area vocational education programs.

Preparation for work roles in the secondary schools is considered by many to be relatively inexpensive when compared to the operating costs of post secondary programs or federal manpower programs which require training allowances and other supplemental services.

It is essential that public education assume responsibility for and be recognized as a national manpower developer. The National Association of School Administrators concluded that, "a comprehensive national manpower policy must be as concerned with the development of human resources as it is with correction of failures."<sup>1</sup> Our national manpower policy must not limit itself only to those who are already unemployed and disadvantaged. Preventive measures should be taken to reduce the flow of high school age students into the ranks of the unemployed and disadvantaged.

Rhodes feels so strongly about public education accepting the responsibility of giving young people

<sup>&</sup>lt;sup>1</sup>Grant Venn, Man, Education, and Manpower (Washington, D.C.: The American Association of School Administrators, 1970), p. 234.

employable skills that his response to the schools failure to do so is: "We shall fight them on the street."<sup>1</sup>

Sydney Marland, Commissioner of Education, United States Office of Education, states:

I propose that a universal goal of American education, starting now, be this: That every young person completing our school program at Grade 12 be ready to enter either higher education or useful gainful employment.<sup>2</sup>

It is estimated that "\$100-plus million"<sup>3</sup> will be spent in the development of a few national models where the entire curriculum of the involved school districts will be structured around a career development theme consistent with Marland's stated goal of American education.

The Division of Vocational Education, Michigan State Department of Education has just announced their new "Career Thrust" which suggests that all students should be taught measurable, salable, occupational skills consistent with their interests, aptitudes and the projected labor force needs.<sup>4</sup>

<sup>3</sup>The Croft Federal Aid Service, 100 Garfield Ave., New London, Connecticut, VI (April 9, 1971), 1.

<sup>4</sup>Career Education Program Model, Michigan Department of Education, Vocational Education and Career Development Service, p. 7.

<sup>&</sup>lt;sup>1</sup>James A. Rhodes, *Alternative to a Decadent Society* (Indianapolis, Ind.: Howard W. Sams and Co., Inc., 1969), p. 36.

<sup>&</sup>lt;sup>2</sup>Sidney P. Marland, Jr., "Career Education Now," Bulletin of the National Association of Secondary Principals, No. 355 (Washington, D.C.: Department of Health, Education and Welfare, May, 1971), p. 4.

The Michigan Department of Education in 1970 completed a study and plan which indicated

. . . a need for approximately 90 secondary area vocational centers in the state in addition to expanded exploratory, pre-vocational programs, and vocational programs in the participating districts to provide occupational preparation for the two-thirds to three-quarters of 9-12 grade students needing such instruction at present educational attainment levels.<sup>1</sup>

As schools move into the manpower development role they are forced to assist students in the development of career plans consistent with projected manpower needs and to offer appropriate occupational preparation programs. Many comprehensive high schools are now increasing their occupational offerings and a number of the recommended secondary area vocational centers have already opened in response to the need to reduce unemployment.

The Genesee Area Skill Center (Skill Center) was the first area vocational center to open in Michigan. This center, which opened in September, 1969, is owned and operated by the Flint Board of Education. Twenty-one school districts send 1,200 secondary students to the Skill Center as agreed to in the provisions of a contract between the Flint Board of Education and the Genesee Intermediate School District. Each school district is given a student quota in

<sup>&</sup>lt;sup>1</sup>A Tentative Plan for the Development of Area Vocational Education Centers in Michigan, Michigan Department of Education, 1970, p. 7.

the 26 occupational preparation programs of the Skill Center. Students attending the center follow the pattern recommended by the State Board of Education. The students enrolled spend half time in the center and half time in their home school.<sup>1</sup>

Students at the tenth grade level are given the opportunity to elect one or two year occupational preparation programs at the Skill Center. There are 16,882 eleventh and twelfth graders in the Genesee Intermediate School District who are eligible to attend the Skill Center.<sup>2</sup> The Skill Center is now serving a capacity 1,211 students. The capacity of the center allows less than 8 percent of those eligible to enroll. It seems important, then, that student choice and placement at the Skill Center not be casual but be carefully planned based on goals, background experience, interests, aptitudes and expected successful outcomes. Presently students are being asked to make career decisions without career plans. Their choices could and often do commit them to one-half time as juniors and seniors in high school classes; time which might better be spent in other ways.

<sup>&</sup>lt;sup>1</sup>A Position Statement Concerning the Development of Area Vocational and Technical Education Programs in Michigan Michigan Department of Education, Lansing, Michigan, July, 1967, p. 4.

<sup>&</sup>lt;sup>2</sup>School District Statistical Information, Board of Education, Genesee Intermediate School District, Flint, MIchigan, 1971, p. 13.

Both the school curriculum and the counseling process can be considered as sources for decision making information relative to individual student career plans. The school curriculum through the tenth grade seldom provides exploratory experiences in most occupational areas. Although there are a number of experimental attempts to relate curriculum to the career planning role, they are sporadic at best; and the appropriateness of these efforts cannot be fully tested until such time as the involved students are faced with their career options. In the meantime, each year another approximately 10,000 tenth grade students move to the decision making point without adequate career plans in the Genesee Intermediate School District alone.<sup>1</sup>

It appears that, at least as a stop gap approach, the counseling process must adapt to the students' need for individualized career plans. There is increasing pressure on counseling staff to increase their emphasis on vocational counseling. These pressures stem from conclusions like the following:

. . . the vocational students were the least likely to have discussed either their course choices or their occupational plans with a guidance counselor. Among the vocational graduates about one-half recalled discussing their course choices, and about one-fifth

<sup>&</sup>lt;sup>1</sup>School District Summaries and Information: 1970-71, Published by Board of Education, Genesee Intermediate School District, Flint, Michigan.

recalled discussing their job plans. Among the academic graduates about three-fourths reported discussing their course choices and about one-third reported discussing job plans.<sup>1</sup>

The value of current guidance practices are in question as they relate to vocational plans.

Now, however, various publics want to know whether guidance is of any value. While in some localities, the guidance movement is still on the upswing, other communities are taking a long look to determine whether the results are actually worth the time and money being spent. Proposed Department of Labor legislation would take much of the counseling guidance activity out of the schools and place it in offices of the U.S. Employment Service (Riccio, 1970). This has led many in the guidance profession to seek an objective tool by which to test the value of the existing program and discover weak areas which need attention.<sup>2</sup>

Gilbert and Ewing noted from their study that:

Contrary to all expectations the direct personal relationship of client and counselor was not of great importance in client acceptance of counseling. . . Therefore, effective learning or appropriate changes in important self-concepts of personal and emotional significance can be achieved without the presence of personal relationship factors previously considered to be so important in face to face counseling. Also even highly experienced counselors showed

<sup>&</sup>lt;sup>1</sup>Jacob J. Kaufman and others, The Role of the Secondary Schools in the Preparation of Youth for Employment, Institute for Research on Human Resources (University Park: Pennsylvania State University, February, 1967), Chapter 12, p. 6.

<sup>&</sup>lt;sup>2</sup>Sidney A. Fine, "The Systems Approach: An Emerging Behavioral Model for Vocational Guidance--A Summary Report," *Research and Development Series*, No. 45, The Center for Vocational and Technical Education, Ohio State University, p. 12.

improvement in their normal counseling following participation in the preparation and use of the programmed materials.<sup>1</sup>

Counselors should not be expected to assume the burden of assisting students to the necessary degree if ratios remain at their current level. The student-counselor ratio in the Genesee Intermediate School District is approximately four hundred to one. Counselors often have little real occupational background yet they have served the college bound students relatively well and tend to feel competent in this area. One might predict that counselors would not be very receptive to a de-emphasis of their college counseling efforts in favor of vocational counseling--an area where they are less adept.

There are efforts to reduce pupil-counselor ratios and to provide inservice for counselors in order to allow them to more realistically relate to the identified vocational planning needs of students. At the same time it seems important to explore ways of making the counseling and career planning process more efficient.

It is suggested that the counseling and career planning process could become highly systemitized. Process evaluation could then take place based on behavioral

<sup>&</sup>lt;sup>1</sup>William M. Gilbert and Thomas N. Ewing, "Programmed Versus Face to Face Counseling," *Journal of Counseling Psychology*, XVIII (1971), 420.

objectives. "Process evaluation, endeavors to detect problems in time, staff, budget, or design."<sup>1</sup> And

methods and techniques must contain specific information if they are to be useful, effective, efficient, appropriate, and of benefit to both practitioners and users.<sup>2</sup>

It appears that the counseling process as well as curriculum will undergo considerable change as schools gear for their role in manpower development. As a workable counseling process is evolving, schools are experimenting with the more structured use of objective measures as counseling tools to assist students in their career planning.

The Genesee Intermediate School District (G.I.S.D.) has developed a computer assisted guidance program. This system uses expressed interest, previous grades, measured interests, and measured aptitudes as well as personal relationships with counselors to assist the student.

Most schools in the G.I.S.D. have altered their testing programs to conform to the computer assisted guidance program. It has been assumed that measured interests, measured aptitudes, and previous grade point average are of value in the selection of students for participation in area vocational programs.

<sup>&</sup>lt;sup>1</sup>Sidney A. Fine, "The Systems Approach: An Emerging Behavioral Model for Vocational Guidance--A Summary Report," *Research and Development Series*, No. 45, The Center for Vocational and Technical Education, Ohio State University, p. 16.

G.I.S.D. through various funding sources has already committed over \$500,000 to the computer assisted guidance program and the Michigan State Department of Education is funding the expansion of the experiment to another large school system for the 1972-73 school year.

Considering the problems of pupil/counselor overload, the inability of most counselors to serve vocational students, and the problems of relating curriculum to career plans together with the need to reduce unemployment and the vast sums being expended to patch up our training-employment system it seems only logical to explore better placement techniques.

# Summary of Need

There is now a rapid trend toward increased occupational preparation options at the secondary level. These increased options force decisions at the ninth grade level without individual student career plans. There is a lack of knowledge concerning predictors of success for students who must make decisions at the ninth grade which are pertinent to their career choices. Traditional assistance to students through curriculum and counseling are not presently adequate. Considerable resources are now being expended with the assumption that the structured use of tests and previous grade point are of value in the selection of students for participation in secondary area vocational programs.

It is felt that this study will contribute significant data pertinent to the improvement of our career planningplacement system.

#### Theory

It is theorized that career decision making can take place during adolescence. Hollender suggests that nearness of decision point, environmental influences, student peer group, and educational level are more pertinent to vocational development than chronological age.<sup>1</sup> Feldman theorized that:

Vocational guidance should then be introduced early in the middle school years, to acquaint the student with the working of industry and commerce and help match his talents with his career objectives. The vocational guidance department should, for instance, provide an annual career-objective analysis for each student, based on the diagnosis, discussions, predictions, and evaluations of teachers, examinations, and computers. These analyses--employment plans that are revised annually--would enable the student to appreciate the relevance of his school performance to his career possibilities.<sup>2</sup>

Katz stated that "lip service to the student's right to make his own career decisions is meaningless if he is not also competent." Katz further suggests that decision making requires four components: values, information, prediction

<sup>1</sup>John W. Hollender, "Development of Vocational Decisions During Adolescence," *Journal of Counseling Psychology*, XVIII (May, 1971), 244-48.

<sup>2</sup>Marvin J. Feldman, "Zeroing in on a Program of Zero Rejects," Condensed from *School Shop*, XXIX (April, 1970), 22. attempts and decision plans for implementation. Katz summarizes by saying: "Indeed I want to emphasize that with the individual as with the school or the nation, decisionmaking should be an ongoing process subject to continual revision."<sup>1</sup> There appears to be support to the theory that vocational decision making not only can, but should, take place in the middle school years. These decisions should be based on a variety of inputs--and be continually updated.

It is believed that measured interest, measured aptitude and previous grade point average can be used to predict success in occupational preparation programs. Holland and Nickols stated in summarizing their study that:

For samples of high scholastic aptitude the results do lend support to the general hypothesis that students tend to sort themselves into fields which are congruent with their personal traits, interests, aptitudes and achievements. These results replicate in part what we have known from the use of aptitude and interest inventories for several decades--students leave fields for which they lack interest and aptitude.<sup>2</sup>

Sharf concluded that interest and ability were only slightly related and that students tend to stress interest

<sup>&</sup>lt;sup>1</sup>Martin R. Katz, "Expanding the Student's Decision Making Power," Bulletin of the National Association of Secondary Principals, No. 346 (May, 1970), 88-95.

<sup>&</sup>lt;sup>2</sup>John L. Holland and Robert C. Nichols, "A Longitudinal Study of Change in Major Field of Study," *Personnel* and Guidance Journal, XLIII (1964), 239.

rather than ability in their educational decision making.<sup>1</sup> Berdie reported that interest was a better predictor than aptitude of which curriculum a student would enter and in which occupation he would be employed 10 years later.<sup>2</sup> In a study of interest and persistence, Taylor found that the *Strong Vocational Interest Blank* did discriminate between persisters and non-persisters in engineering programs.<sup>3</sup> Johnson suggested that "until further research is conducted, the test user should show considerable caution in interpreting S.V.I.B. scores as indicators of differential academic achievement."<sup>4</sup> Academic achievement in Johnson's work was measured with a single test. Johnson suggested that."other measures of differential academic achievement, for example, grades in course work or ratings of achievement in more diverse academic areas should be obtained in order

<sup>3</sup>Ronald G. Taylor and Gary R. Hanson, "Interest and Persistence," *Journal of Counseling Psychology*, XVII, No. 6 (1970), 507.

<sup>4</sup>Richard W. Johnson, "Are S.V.I.B. Interests Correlated with Differential Academic Achievement?" *Journal* of Applied Psychology, XLIX, No. 4 (1965), 309.

<sup>&</sup>lt;sup>1</sup>Richard Sharf, "Relative Importance of Interest and Ability in Vocational Decision Making," *Journal of Counseling Psychology*, XVII (1970), 258.

<sup>&</sup>lt;sup>2</sup>*Ibid.*, p. 258.

to more thoroughly investigate the nature of the relationship between interest and differential achievement.<sup>1</sup>

It is assumed throughout this study that grades in area vocational programs can be used as measures of success since those grades are interpreted for recommendations and by prospective employers in terms of the student's preparation for entry into the labor market. Richard Loomis, Principal of Genesee Area Skill Center, states that "grades at the area center are based on the degree to which students meet the entry level requirements of the occupational area for which they are preparing."<sup>2</sup> The Michigan State Department of Education, Division of Vocational Education, is requiring all reimbursed vocational programs to report placement figures and develop objectives in behavioral terms consistent with the students' entry level needs for employment.

## Theory Summarized

It is theorized that career decision making can and should take place during adolescence. It is also theorized that measured interests, measured aptitudes, and previous grade point average are necessary to career decision making.

Although there seems to be some question regarding the relationship between interests and aptitude, it appears

<sup>2</sup>Personal interview.

<sup>&</sup>lt;sup>1</sup>*Ibid.*, p. 309.

that these factors as well as previous grade point are generally used in and are appropriate to the career planning process.

If the theory is found to be valid, it should then be possible to systemetize the use of these measures for career planning. This could increase the effectiveness of the public schools in their manpower development function.

#### Null Hypotheses

<u>Hypothesis 1</u>: There is no relationship between interests measured with the Ohio Vocational Interest Survey (O.V.I.S.) and grades received in Skill Center courses.

<u>Hypothesis 2</u>: There is no relationship between grades predicted by the Vocational Planning Inventory (V.P.I.) and grades received in Skill Center courses.

<u>Hypothesis 3</u>: There is no relationship between junior high school grade point average (G.P.A.) and grades received in Skill Center courses.

<u>Hypothesis 4</u>: There is no relationship between measured interest and measured aptitude as measured by the O.V.I.S. and the V.P.I.

<u>Hypothesis 5</u>: A combination of O.V.I.S. measured interest, V.P.I. measured aptitude, and previous grade point average will not predict grades in Skill Center courses at a higher level of significance than any of these indicators taken singly.

#### Definition of Terms

Most of the terms listed in this section are commonly used in education. They are, however, often used with different interpretations of their meaning. The following definitions clarify the use of these terms in this study: Manpower Development: Education of training for job

upgrading or entry employment.

- Labor Force: That part of the population involved in gainful employment.
- Labor Market: The relative supply of and demand for workers.
- Skilled Labor: Workers whose skill required two or more years in development.
- Unskilled Labor: Workers whose skill required less than two years in development.
- Vocational Program: A program designed to develop sufficient skill for job entry.
- Occupational Program: A program which includes exploratory experiences as well as entry level skill development of vocational programs.
- Occupational Clusters: Groups of related occupations or jobs requiring similar preparation.
- Vocational Education: All education whose objective is preparation for job entry.
- Secondary Schools: Schools which include any of the grades nine through twelve.

- Comprehensive Schools: Those schools which attempt to offer sufficient variety in their curriculum to meet individual needs.
- Career Education: Education which uses careers or occupations as central themes in all disciplines, culminating in skill development for job entry prior to leaving school.
- Skill Center: An area vocational center drawing on the population base of several secondary schools which send students for one-half day for vocational education.
- Area Vocational Center: A shared time facility offering half-time vocational programs to students from sponsoring school districts.

Home Schools: The sending school for students participating in area vocational programs on a shared time basis. Career Plans: A personal plan for reaching career goals based on objective data and including anticipated educational, work, and personal experience components.

Occupational Preparation Options: Secondary school electives leading to entry level skill development. Vocational Counseling: Counseling for the purpose of

developing or implementing career plans. Measured Interests: Interests indicated through the use of a written test or inventory.

Measured Aptitudes: Aptitudes indicated through the use of written instruments.

Vocational Maturity: The location a person has reached on a career development continuum from birth through death.

## Organization of the Study

The relevance of this study in the developing manpower role of public education has been presented in Chapter I. The literature related to the use of measured aptitude, measured interest, and previous grade point average as preditors in career planning will be reviewed in Chapter II. The specifications of the sample, nature and sources of data, testable hypotheses and analysis procedure will be presented in Chapter III. The results of the analysis will be presented in Chapter IV, and the conclusions and summary will be presented in Chapter V.

#### CHAPTER II

#### A REVIEW OF RELATED LITERATURE

# Introduction

A review of the literature as it relates to the use of tests in career planning will be presented in this chapter. Emphasis is placed on the specific uses of the variables of concern in this study (i.e., measured interest, measured aptitude, and previous grade point average).

# Use of Tests in Career Planning

Frank Parsons, considered the father of vocational guidance, described, in his 1908 Director's Report, guidance procedures used with the Bureau's clientele and ended with the plea that vocational guidance "should become a part of the public school system in every community, with experts trained as carefully in the art of vocational guidance as men are trained today for medicine or the law, and supplied with every facility that science can devise for testing the senses and capacities and the whole physical, intellectual, and emotional makeup of the child."<sup>1</sup>

<sup>&</sup>lt;sup>1</sup>Henry Borow, Man in a World at Work (Boston: Houghton Mifflin Company, 1964), p. 49.

Although the guidance function is 64 years old this same plea could well be made today. As documented in Chapter I of this study public education is attempting to adapt both the curriculum and the guidance function to a vocational development process. This process should provide a background of information and experience which would allow occupational choices to become increasingly specific and relevant to vocational opportunity.

Super<sup>1</sup> identifies stages of vocational development as: Growth, Birth to age 14; Exploration, 15-24; Establishment, 25-44; Maintenance, 45-65; and Decline, 65 to death. Several of these stages are divided into sub-stages. This study is concerned with the exploration stage and suggests that our changing socio-economic structure is forcing these stages to occur earlier in life. The exploration stage is explained as that period where youth begin to crystallize, specify, and implement a vocational preference.

Havighurst<sup>2</sup> identified developmental tasks associated with the various vocational life stages. Among the tasks in the exploration stage are the further clarification of interests, aptitudes, and values, further developing

<sup>&</sup>lt;sup>1</sup>Donald E. Super, *Psychology of Careers* (New York: Harper, 1957, pp. 71-72.

<sup>&</sup>lt;sup>2</sup>Robert J. Havighurst, Human Development and Education (New York: Longmans, Green, 1953), p. 42.

abilities and talents and choosing high school curricula, and formulating appropriate post-high school plans.

Buehler,<sup>1</sup> Miller,<sup>2</sup> and Ginzberg<sup>3</sup> agree that vocational development or maturity occurs in life stages that are identifiable by the degree to which an individual clarifies his personal characteristics and adapts them to his environment.

It is the function of guidance and counseling to assist individuals in the vocational development process. Super<sup>4</sup> identifies two types of information that must be known about an individual before there can be an evaluation of his vocational prospects: social facts and psychological facts.

Social facts are those of environment, outside influences, and resources. These are generally acquired through interview, questionnaire, and observation. Social facts are not of immediate concern in this study. This should not be interpreted to mean that the value of social

<sup>2</sup>D. C. Miller and W. H. Form, *Industrial Sociology* (New York: Harper and Row, 1951), p. 87.

<sup>&</sup>lt;sup>1</sup>Charlotte Buehler, Der Menschlicke Lebenslauf als Psychologisches Problem (Leipzig: Hirzel, 1933), cited by Donald E. Super, Psychology of Careers (New York: Harper and Brothers, 1957).

<sup>&</sup>lt;sup>3</sup>Eli Ginzberg, "Toward a Theory of Occupational Choice," *Occupations*, XXX (1951), 491-94.

<sup>&</sup>lt;sup>4</sup>Donald E. Super, Appraising Vocational Fitness (New York: Harper and Brothers, 1949), p. 6.

facts is not recognized. The point has been made that the purpose of this study is to examine the relative importance of selected psychological facts which might then be used more efficiently in conjunction with other information available to the counseling process.

Psychological facts are those which describe aptitudes, skills, interests and personality traits. Psychological facts are generally determined through testing programs and objective measures.

Warters suggests that testing is the most commonly used specialized technique in guidance and lists these advantages:

- Tests produce certain types of information more economically than other procedures.
- Objective tests properly administered and scored yield more accurate information than the view subjective techniques such as interview, questionnaire, and observation.
- Judgements made on the basis of test results are superior to judgements based on teacher reports--because they are more accurate.
- Tests provide information in meaningful terms through quantitative description of data.
- Tests aid in the identification of students in need of special attention.
- Tests can facilitate the study of growth or change in certain areas.<sup>1</sup>

Warters cautions about errors that can be made in the use of tests. She believes that tests are crude

<sup>&</sup>lt;sup>1</sup>Jane Warters, *Techniques of Counseling* (New York: McGraw-Hill Book Company, Inc., 1954), p. 22.

instruments and at best are only indicators of what they purport to measure. Specific limitations mentioned were:

- Tests are not refined tools that give exact measurements.
- Tests do not provide comprehensive measurement.
- Tests yield a score but do not indicate why he made the score.
- Tests show what a student will do under test situations not what he will do under other conditions.<sup>1</sup>

Linden,<sup>2</sup> Carp,<sup>3</sup> and Barry<sup>4</sup> express concern for the tendency to be overly dependent on the psychological facts gathered in testing. Feingold and Swerdloff make the point emphatically when they state:

Let's make it clear right now before we go any further: No tests, by themselves, will tell you what you should do when you grow up. Tests can, however, provide clues to narrow down the possible fields.<sup>5</sup>

<sup>1</sup>*Ibid.*, pp. 23-28.

<sup>2</sup>James D. Linden, *Tests on Trial*. Series III: Testing Guidance Monograph Series (Boston: Houghton Mifflin Company, 1969), pp. 88, 91.

<sup>3</sup>A. Carp, "Evaluating Personal Potentials," in Computer-Based Vocational Guidance System, U.S. Department of Health, Education and Welfare: Office of Education (Washington, D.C.: Government Printing Office, 1969).

<sup>4</sup>Ruth Barry and Beverly Wolf, Epitaph for Vocational Guidance (New York: Bureau of Publications, Teachers College, Columbia University, 1962), pp. 49-56.

<sup>5</sup>Feingold and Swerdloff, Occupations and Careers (St. Louis, Mo.: Webster Division, McGraw-Hill Book Company, 1969), p. 15. Recognizing the limitations of tests and the concerns expressed by experts there is still general acceptance of tests as predictive tools in the guidance and counseling process. Ross emphasizes the need to recognize the virtues of testing in spite of their imperfections and make the best of them as tools while waiting for the development of better measures. He uses the analogy of the farmer who refuses to buy an automobile until "they perfect the darn things."<sup>1</sup>

Barry and Wolf<sup>2</sup> emphasize the point that today no school can afford not to test its students. Marland has recommended to the College Entrance Examination Board that they assume the responsibility for the development of a comprehensive testing institution "which would establish a valid measure of competence for job entry, whether on the completion of high school, or of post-secondary technical education, or both."<sup>3</sup> He emphasizes that examinations sponsored by the College Entrance Examination Board are symbols of excellence and that approximately half of the students are not served by these examinations or others designed to meet their needs.

<sup>&</sup>lt;sup>1</sup>C. C. Ross, *Measurement in Today's Schools* (2nd. ed.; New York: Prentice Hall, Inc., 1947), p. 98.

<sup>&</sup>lt;sup>2</sup>Ruth Barry and Beverly Wolf, *Epitaph for Vocational Guidance* (New York: Bureau of Publications, Teachers College, Columbia University, 1962), p. 208.

<sup>&</sup>lt;sup>3</sup>Sidney A. Marland, "A Proposal for a Comprehensive System of Testing for Job Entry," *Report of the Commission on Tests*, *II. Briefs* (New York: College Entrance Examination Board, 1970), p. 73.
Many writers agree that measured interests, measured aptitude, and some measure of past achievment are basic to the psychological aspect of guidance and counseling.<sup>1</sup>

Thorndike<sup>2</sup> explains that tests generally measure what a person can do and what he will do. The "can do" tests measure ability and can be divided into measures of aptitude and of achievement. The "will do" tests he labeled as personality measurements.

Three types of tests are mentioned in the above classifications: achievement, aptitude, and personality. Achievement tests are used when there is an interest in knowing what the individual has learned in the past. Aptitude tests are used to predict what an individual can learn or do in the future. Personality tests are most often measurements of character, adjustment, temperament, interest, and attitude.

<sup>2</sup>Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, Inc., 1961), p. 22.

<sup>&</sup>lt;sup>1</sup>Robert H. Bauernfeind, School Testing Programs, Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1968), pp. 28-35; Sidney P. Marland, "A Proposal for a Comprehensive System of Testing for Job Entry," Report of the Commission on Tests, II. Briefs (New York: College Entrance Examination Board, 1970), pp. 68-82; James D. Linden, Tests on Trial, Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1969), p. 89; and James R. Barclay, Controversial Issues in Testing, Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1969), p. 25.

Frochlich and Darley<sup>1</sup> agree that the same three kinds of tests are needed in the counseling process with nearly all students--tests of interest, aptitude, and achievement.

### Measured Interests

Measured interests fall in Thorndike's<sup>2</sup> "will do" category; the theory being that achievement and aptitude measures are indicators of whether or not the individual can accomplish an objective, and measured interest is an indicator of personality characteristics which will make him want to seek out and participate in certain activities and/or accomplish certain objectives.

Stodola and Stordahl<sup>3</sup> suggest that interest inventories are used (1) to encourage exploration and (2) to call attention to inappropriate academic and vocational objectives.

Linden and Linden in the review of interest measures state that:

<sup>&</sup>lt;sup>1</sup>C. P. Froehlich and J. G. Darley, *Studying Students* (Chicago: Science Research Associates, 1952), p. 214.

<sup>&</sup>lt;sup>2</sup>Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, Inc., 1961), p. 22.

<sup>&</sup>lt;sup>3</sup>Quentin Stodola and Kalmer Stordahl, Basic Educational Tests and Measurement (Chicago: Science Research Associates, Inc., 1967), p. 201.

. . . the Strong Vocational Interest Blank--Male Form has demonstrated gross predictive validity and remains the most impressive habitual report device that has been employed in counseling work to date.<sup>1</sup>

Sharf<sup>2</sup> reports that interest is stressed more than ability in the decision making of students and expresses agreement with Berdie (1955) that interest is a better predictor than aptitude of which curriculum and occupation a student will enter.

The evidence seems to indicate a general acceptance of the use of interest inventories. However, most authors are careful to point out the limitations. Thorndike cautions that "closeness of correspondence with the typical may be pointed out to the counselee, but we would hesitate to counsel avoidance of an occupation solely because his interest pattern departs from what is typical of the occupation."<sup>3</sup>

Johnson<sup>4</sup> suggested caution in the use of the Strong Vocational Interest Blank in predicting academic achievement.

<sup>2</sup>Richard Sharf, "Relative Importance of Interest and Ability in Vocational Decision Making," *Journal of Counseling Psychology*, XVII (1970), p. 258.

<sup>3</sup>Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, Inc., 1961), p. 527.

"Richard W. Johnson, "Are S.V.I.B. Interests Correlated with Differential Academic Achievement?" Journal of Applied Psychology, XLIX, No. 4 (1965), 309.

<sup>&</sup>lt;sup>1</sup>James D. Linden, *Tests on Trial*, Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1969), pp. 84-85.

Further study was suggested specifically in the area of correlating Strong Vocational Interest Blank with grades in course work. This study will produce these correlations with the Ohio Vocational Interest Survey scores.

There has been little success in correlating scales between various interest inventories. Cole and Hansen, however, have developed a model illustrating how correspondence of the scores on two or more interest inventories "can best be determined by considering patterns of scales."<sup>1</sup>

Kuder,<sup>2</sup> in responding to concerns over the relatively low correlations between occupational scores from different interest inventories, points out that different inventories measure different things and that correlations with raw scores from other inventories have little bearing on whether the inventory is accomplishing the purpose for which it was intended. He suggests that interest inventories should be compared by determining the extent to which they lead to similar results in the counseling process.

Most experts agreed that more study, comparing the various interest inventories, is needed.

<sup>&</sup>lt;sup>1</sup>Nancy S. Cole and Gary R. Hanson, "An Analysis of the Structure of Vocational Interest," *Journal of Counseling Psychology*, XVIII (September, 1971), 478.

<sup>&</sup>lt;sup>2</sup>Frederic Kuder, "A Note on the Comparability of Occupational Scores from Different Interest Inventories," in *Measurement and Evaluation in Guidance*, American Personnel and Guidance Association, Vol. II, No. 2 (Summer, 1969), pp. 94-100.

No studies were identified that attempted to discuss the correlation of measured interest with either measured vocational aptitude or grades received in vocational courses. There does, however, seem to be evidence that the likelihood of a high correlation is not probable. Although Strong concluded that "interests reflect inborn abilities,"<sup>1</sup> Super points out that there is "little evidence by means of which this inductive hypothesis can be verified or rejected."<sup>2</sup>

Thorndike states that "correlations of interest scores with academic achievement in general or in specific areas are generally rather low. . . Interest is not a substitute for ability, and, conversely the ability to learn the skills of a job is no guarantee of success or satisfaction in the job."<sup>3</sup>

Thorndike also indicates that "correlation of achievement with interest in a corresponding area will run about .30 to .50. Thus there is some slight tendency for those with high ability for a field of knowledge to show high interest in it."<sup>4</sup> The point is made that the

<sup>4</sup>Ibid., p. 332.

<sup>&</sup>lt;sup>1</sup>E. K. Strong, Jr., Vocational Interests of Men and Women (Palo Alto: Stanford University Press, 1943), p. 882.

<sup>&</sup>lt;sup>2</sup>Donald E. Super, Appraising Vocational Fitness (New York: Harper and Brothers, 1949), p. 397.

<sup>&</sup>lt;sup>3</sup>Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, Inc., 1961), p. 527.

relationship is too low for one to substitute for the other; both measures are needed for sound evaluation.

It appears that although there are concerns about the over-use of interest measures, they can be a valuable predictive tool in the guidance and counseling process.

# Aptitude Tests

Aptitude tests attempt to measure an individual's potentialities for future development within certain job categories. They are of two types: (1) batteries and (2) tests for specific potentialities. Lyman<sup>1</sup> differentiates between the batteries and specific tests: a battery produces scores in a variety of areas and is intended as a counseling tool to assist in the decision making process, while tests for specific potentialities are for specialized use in industrial or business personnel situations. The *Vocational Planning Inventory* (V.P.I.)<sup>2</sup> is an example of an integrated aptitude test battery and is used in this study. The V.P.I. produces scores in ten areas:

- 1. General Academic
- 2. General Vocational
- 3. Business
- 4. Mechanics and Mechanical Maintenance

<sup>&</sup>lt;sup>1</sup>Howard B. Lyman, Intelligence, Aptitude, and Achievement Testing, Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1968), p. 13.

<sup>&</sup>lt;sup>2</sup>Vocational Planning Inventory: Your V.P.I. Report and What It Means (Chicago: Science Research Associates, Inc., 1968), p. 3.

- 5. Drafting and Design
- 6. Metal Trades
- 7. Home Economics and Health
- 8. Construction Trades
- 9. Electronics and Electrical Trades
- 10. Agriculture

A battery of tests is said to be integrated if all the tests in the battery were standardized on the same group of individuals--thus allowing all of the tests to be directly compared.

Friedenberg states that: "the accepted function of aptitude and achievement testing is to identify, select, and appraise the best qualified individual competitors for membership and preferment within a meritocratic hierarchy."<sup>1</sup> He goes on to point out that this assumption has not been seriously questioned by the College Entrance Examination Board.

Literature relating to the use of aptitude tests is quite specific in the way scores can be used in prediction. According to Bauernfeind: "Good reading and arithmetic, plus good spatial and mechanical, could suggest engineering or technology as a career choice."<sup>2</sup> Crawford supports the use of tests as predictors when referring to an aptitude battery as follows: "He should be able to obtain honors

<sup>&</sup>lt;sup>1</sup>Edgar Z. Friedenberg, "Can Testing Contribute to the Quest for Community Among Students?" *Report of the Commission on Tests, II. Briefs* (New York: College Entrance Examination Board, 1970), p. 34.

<sup>&</sup>lt;sup>2</sup>Robert H. Bauernfeind, *School Testing Programs*. Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1968), p. 31.

in. . . . " "He should certainly not be making the most fruitful use of his talents by pursuing technological studies."<sup>1</sup>

There seems to be considerable support for the use of aptitude tests in prediction, however, research indicates that they should only be used as indicators and not be used without discretion. Stodola and Stordahl feel that it is a major problem that subtests have relatively high intercorrelations and thus no sound basis for differential prediction. They state that "results of such tests do not provide information to help make clear-cut academic and vocational decisions.<sup>\*2</sup>

Perhaps Super<sup>3</sup> clarifies the issue when he explains the term aptitude as a combination of traits and abilities rather than a single score being used as a predictor.

There does appear to be some question as to the proper use of predictive instruments. The premise of this study is that, whatever their value, they are being used both in counseling interviews and computer programming-thus their relative merits should be measured.

<sup>3</sup>Donald E. Super, Appraising Vocational Fitness (New York: Harper and Brothers, 1949), pp. 58-59.

<sup>&</sup>lt;sup>1</sup>A. B. Crawford and P. S. Burnham, Forecasting College Achievement (New Haven: Yale University Press, 1946), p. 141.

<sup>&</sup>lt;sup>2</sup>Quentin Stodola and Kalmer Stordahl, Basic Educational Tests and Measurement (Chicago: Science Research Associates, Inc., 1967), p. 178.

### Grade Point Average

The literature has been reviewed relative to grade point average as a predictor of success in vocational programs. There seems to be no data supporting this approach. There is, however, evidence suggesting the reverse--that grades have limited value in prediction.

Thorndike identifies grades as judgments of one person by another which sometimes is intuitive or subjective. Judgment procedures can vary from pupil to pupil, class to class, and teacher to teacher. Thorndike summarizes his position when he says:

The variation from teacher to teacher and place to place bears witness to the fact that no fundamental anchor or reference point exists for grades.<sup>1</sup>

Tyler reported that the Eight Year Study indicated "a more efficient selection could be made by using a battery of tests, than by depending upon the previous educational record of the student."<sup>2</sup>

Warters suggests that "the superiority of test data to teachers' judgments as indicated by school marks has led some colleges to change their criteria for college

<sup>&</sup>lt;sup>1</sup>Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, Inc., 1961), p. 485.

<sup>&</sup>lt;sup>2</sup>Ralph W. Tyler, "The Road to Better Appraisal," Journal of the National Education Association, XXXVIII (May, 1948), 336.

admissions."<sup>1</sup> Although many colleges still require grade point averages for admission, their rational is not evident; and some colleges question the value of grades in reflecting all of the qualities of an education.<sup>2</sup>

Although there appears to be little evidence to support the use of previous grade point average in prediction, this is one of the measures utilized in the counseling process. Mr. Alva Mallory, Director of Vocational Education, Genesee Intermediate School District, in an interview advised that previous grade point is an input in their computer assisted guidance program. Various guidance and counseling specialists from the involved twenty-one school districts reviewed and approved the design being used in that computer assisted guidance program.

Mrs. Barbara Heck, Consultant of Counseling and Guidance for the Flint Community Schools noted that most colleges still require grade point averages in their admission procedures.

### Summary

The use of tests in the vocational guidance and counseling process has been reviewed in this chapter. The

<sup>&</sup>lt;sup>1</sup>Jane Warters, *Techniques of Counseling* (New York: McGraw-Hill Book Company, Inc., 1954), p. 19.

<sup>&</sup>lt;sup>2</sup>James R. Barclay, *Controversial Issues in Testing*, Series III: Testing, Guidance Monograph Series (Boston: Houghton Mifflin Company, 1969), p. 17.

increasing dependence on tests since 1908 was presented in the context of a vocational development theory of life stages. The function of guidance and counseling process was reviewed. The advantages and limitations of testing were presented. Although evidence indicates that psychological facts gathered from testing must be used with caution, there seems to be general support for their increased use. The use of social facts gathered through more subjective means deserves the same degree of caution in their use as psychological facts. Super expressed this concern by saying:

Despite the evidence which shows that subjective methods of evaluating applicants for employment add little or nothing to the predictive value of well-constructed and validated objective tests, personnel men and vocational psychologists continue to utilize interviews, application blanks, rating scales and letters of recommendation in selecting employees.<sup>1</sup>

Evidence was presented to indicate that eventually all secondary students might be involved in comprehensive testing programs designed to match them with the labor market as well as higher education programs.

It seems evident from the literature reviewed that measured interests, measured aptitudes and achievement are basic psychological components of the guidance and counseling process. The variables of this study are consistent

<sup>&</sup>lt;sup>1</sup>Donald E. Super, Appraising Vocational Fitness (New York: Harper and Brothers, 1949), pp. 23-24.

with the three recommended measures. These three measures (interest, aptitude, and achievement) were reviewed in some detail.

It appears from the literature that measured interest is the most widely used of the psychological measures and has had the greatest predictive success. Measured interest is an indicator of personality characteristics which will make an individual want to participate in certain activities.

While measured interest attempts to indicate the will or desire to participate, measured aptitude attempts to measure the ability or the potential for participation. Aptitude batteries are designed as predictive tools in the counseling process and are often used specifically in decision making.

There seems to be little evidence to support the use of grade point average in prediction of vocational success. The changing criteria in marking from pupil to pupil, class to class, and teacher to teacher was brought out. The evidence seems to favor testing as a predictor over grade point average. It was, however, pointed out that grade point averages are used in the counseling process.

No studies were found or reported specifically dealing with measured interest, measured aptitude, or previous grade point average as predictors of grade in vocational

programs. It is felt that this is a symptom of the fact that guidance and counseling is still not a clearly defined Super summarizes this when he states: "... as process. far as I know, no one has ever studied the nature of the planning process, the various methods of facilitating planning in counseling or their relative effectiveness."<sup>1</sup> It is pointed out that "while clients have learned a great deal about themselves as a result of testing, they have had no help in deciding what to do with their talents."<sup>2</sup> Efforts to computerize vocational guidance systems are bringing to light the evident lack of a planning process model. Increased pressure on secondary education to assume a major role in manpower development is also bringing to light this lack of a process model.

No studies were found attempting to improve the process of selecting students for participation in secondary area vocational programs through the identification of predictor variables. It appears that the process most often used is an open election system with students responsible for their own choice which is often based on inadequate information.

<sup>&</sup>lt;sup>1</sup>Donald E. Super, "Basic Function of Guidance and Counseling: Planning Personal Career Development," in *Computer-Based Vocational Guidance System*, U.S. Department of Health, Education and Welfare (Washington, D.C.: Government Printing Office, 1969), p. 4.

The review of literature in this chapter seems to support the need for this study to determine the relative effectiveness or value certain guidance and counseling tools might have in a planning process model.

### CHAPTER III

## DESIGN AND METHODOLOGY

# Introduction

The design and methodology of this study is presented in four sections; the sample, the nature and sources of data, testable hypotheses, and an analysis procedure. The chapter is concluded with a brief summary.

## The Sample

The sample for this study was selected from approximately 600 juniors now attending the Genesee Area Skills Center (Skill Center). The Skill Center serves twenty-one school systems in the Genesee Intermediate School District (G.I.S.D). All of the local school systems in the G.I.S.D. send students to the Skill Center on a quota basis. Quotas for each of the Skill Center programs are based on the local school system's eligible population. The boundaries of the G.I.S.D. approximate those of Genesee County; the sample is geographically representative of Genesee County.

Genesee County is located in Southeastern Michigan, and approximates the center of the major population areas of the state. The county lies close to the metropolitan 'areas

of Detroit, Lansing, Port Huron, and the tri-city area of Saginaw, Bay City, and Midland.

Buick Motor Division, A. C. Spark Plug, and the fabricating, motor, and parts plants of Chevrolet Motor Division have their headquarters in the City of Flint and Genesee County. "With approximately 50 percent of the work force either employed by General Motors or by direct suppliers to the G.M. complex, the assembly and sales of automobiles comprise the basic economy of Flint and the surrounding area."<sup>1</sup>

Genesee County has a population of 492,702 (1970). The population of the City of Flint is 193,317 (1970). Of the 7,396 juniors in G.I.S.D., 2,807 attend the four Flint high schools; the remainder attend the twenty-one high schools located in the county. The Flint city schools are homogeneous socio-economically and racially. The county schools are predominantly white. Eleven of the county schools are considered middle class, six slightly below and four slightly above middle class.<sup>2</sup>

In the 1969-70 school year all ninth graders in the G.I.S.D. were tested using the Ohio Vocational Interest Survey and the Vocational Planning Inventory. Four hundred and

<sup>&</sup>lt;sup>1</sup>Area Manpower Review, Michigan Employment Security Commission, April, 1971.

<sup>&</sup>lt;sup>2</sup>School District Statistical Information, Board of Education, Genesee Intermediate School District, Flint, Michigan, 1971, p. 1.

twenty-seven eleventh grade students now attending the Skill Center and having complete test data from the ninth grade constitute the sample used in this study.

### TABLE 3.1

DISTRIBUTION OF SAMPLE BY SKILL CENTER PROGRAM

Skill Center Program	Number	Skill Center Program	Number
Commercial Art	14	Small Engine Mechanics	14
Architectural Drawing	15	Aviation Mechanics	13
Mechanical Drawing	13	Machine Occupations	14
Graphic Arts	17	Electronics Occupations	76
Intensive Office	21	Welding	8
Data Processing	26	Heating and Cooling	18
Health Occupations	25	House Construction	41
Auto Mechanics	29	Floriculture	16
Auto Body Repair	15	Landscaping	11
Commercial Truck Mechanics	13	Cosmetology	28
Total			427

#### Nature and Sources of Data

The results of the Ohio Vocational Interest Survey and the Vocational Planning Inventory administered to the sample in the ninth grade was made available for this study. This test data plus the grade point averages from the ninth grade and Skill Center vocational course grades comprise the data used in this study.

# Ohio Vocational Interest Survey (O.V.I.S.)

"The primary purpose of the O.V.I.S. is to help students to understand their interests and relate them to the world of work."<sup>1</sup> The O.V.I.S. is used in the following ways:

- to help students choose a high school program and make post-high school plans
- to help potential drop outs make realistic vocational plans consistent with their interest and abilities
- to assist guidance counselors in planning occupational units for group guidance classes
- to serve as a basis for building an occupational information file
- to help administrators plan for curriculum expansion

<sup>&</sup>lt;sup>1</sup>Ohio Vocational Interest Survey: Manual for Interpreting (New York: Harcourt Brace Jovanovich, Inc., 1970), p. 32.

• to identify groups of students interested in specific vocational programs.<sup>1</sup>

The O.V.I.S. interest scales represent the job activities of the entire spectrum of 21,741 different jobs listed in the 1965 edition of Dictionary of Occupational Titles (D.O.T.). The data-people-things approach of the D.O.T. was used in the O.V.I.S. development so that an occupational information linkage could be established with materials using the D.O.T. classification system.

The interest inventory of the O.V.I.S. consists of 280 job activity items. Students respond to each item in one of the following ways: "Like very much," "Like," "Indifferent to," "Dislike," and "Dislike very much." They are to consider each item as something that would be done as part of a full time job. Sample items from the inventory are as follows:

- 23. Drive a tractor-trailor truck
- 86. Plant tree seedlings
- 146. Teach people to drive a car
- 214. Make up beds for old people.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup>Ohio Vocational Interest Survey (Information Brochure) (New York: Harcourt Brace Jovanovich, Inc., 1970).

<sup>&</sup>lt;sup>2</sup>Ohio Vocational Interest Survey (Interest Inventory) (New York: Harcourt Brace Jovanovich, Inc., 1970), pp. 7-13.

Machine scoring is done by Harcourt, Brace and World, Inc. and is reported in student report folders for each pupil. The folder contains a profile chart, brief description of each of the 24 O.V.I.S. scales, and directions for interpretation.

The profile chart provides the 24 scale scores, percentile ranks, stanines, and scale clarity scores. The scale scores are the sum of the item scores related to each of the classifications. The scale score expresses the strength of the student's interests. The percentile ranks and stanines allow comparisons of the student's interest scores with those of students in the normative sample. The scale clarity scores show how consistent student responses are within each scale. Descriptions of the O.V.I.S. interest classifications are as follows:

- Manual Work (001)--Unskilled use of tools and routine work done by hand. Includes construction worker, farm hand, firefighter, dishwasher, janitor, and furniture mover.
- Machine Work (002)--Operating and adjusting machines used in processing or manufacturing. Also includes driving tractor-trailer trucks and operating heavy equipment.
- 3. Personal Services (010)--Providing routine services for people as a waiter, waitress, household worker, doorman, messenger, gas station attendant, train conductor, policeman, fashion model, steward, or stewardess.
- 4. Caring for People or Animals (011)--Routine work related to the day-to-day needs of people or animals. Includes working in a nursing home, nursery, hospital, pet store, zoo, or animal laboratory.

- 5. Clerical Work (100)--Typing, recording, filing, and other clerical or stenographic work.
- 6. Inspecting and Testing (101)--Sorting, measuring, or checking products and materials; inspecting equipment or public facilities.
- 7. Crafts and Precise Operations (102)--Skilled use of tools or other equipment as in the building trades, machine installation and repair, or the operation of trains, planes, and ships. Includes carpenter, welder, tool and die maker, watch repairman, television technician, mechanic, and appliance repairman.
- 8. Customer Services (110)--Waiting on customers in stores, banks, motels, offices, or at home; helping telephone customers with business orders, reservations, and other information. Also include tour guides, bus drivers, and ticket and toll collectors.
- 9. Nursing and Related Technical Services (111)--Providing services as a nurse, physical therapist, X-ray or medical laboratory technician, or dental hygienist.
- 10. Skilled Personal Services (112)--Providing skilled services to people such as tailoring, cooking, barbering, or hairdressing.
- 11. Training (120)--Instructing people in employment or leisure-time activities such as games, crafts, flying, driving, and machine operation. Also includes training dogs, horses, and other animals.
- 12. Literary (200)--Writing novels, poetry, reviews, speeches, or technical reports; editing; translating.
- 13. Numerical (200)--Using mathematics as in accounting, finance, data processing, or statistics.
- 14. Appraisal (201)--Determining the efficiency of industrial plants and businesses, evaluating real estate, surveying land, and chemical or other laboratory testing.

- 15. Agriculture (202)--Farming, forestry, landscaping, and plant or animal research.
- 16. Applied Technology (202)--Applying engineering principles and scientific knowledge. Includes physics, chemistry, geology, architecture, and mechanical or other types of engineering.
- 17. Promotion and Communication (210)--Advertising, publicity, radio announcing, journalism, news information service, interviewing, recruiting; also providing legal services as a judge or lawyer.
- 18. Management and Supervision (210)--Administrative or supervisory work, such as shop foreman, supervisor, school administrator, police or fire chief, head librarian, executive, hotel manager, and union official. Includes owning or managing a store or business.
- 19. Artistic (212)--Interior decoration, display work, photography, commercial and creative art work, and artistic restoration.
- 20. Sales Representative (212)--Demonstrating and providing technical explanations of products or services to customers; selling products or services and providing related technical assistance. Includes department store buyer, factory sales representative, wholesaler, and insurance or real estate salesman.
- 21. Music (220)--Composing, arranging, conducting, singing, or playing instruments.
- 22. Entertainment and Performing Arts (220)--Entertaining others by participating in dramatics, dancing, comedy routines, or acrobatics.
- 23. Teaching, Counseling, and Social Work (220)--Providing instruction or other services in a school, college, church, clinic, or welfare agency. Includes instruction in art, music, ballet, or athletics.

24. Medical (222)--Providing dental, medical, surgical, or related services for the treatment of people or animals.<sup>1</sup>

## Vocational Planning Inventory (V.P.I.)

The V.P.I. is a comprehensive aptitude battery of fifteen separate tests. The purpose of these tests is to measure each student's own particular pattern of ability, aptitudes, achievement, and values in order to predict grade points. Predictions show the grade point average most likely to be obtained by the student in course work in each of eight vocational curriculum areas and the general areas of vocational course work and academic course work. The value of the V.P.I. lies in allowing the student to look ahead and see his predicted relative success in various course-work areas before enrolling in them.

The main categories of tests given in the V.P.I. are: S.R.A. Pictorial Reasoning, Expression, Assembly, Memory, Arithmetic, Survey of Values, S.R.A. Verbal Form, Mechanics, and S.R.A. Arithmetic Index. The counselors report form includes component tests scores. Counselors are cautioned in the use of component scores since each component is weighted differently in calculating predictions

<sup>&</sup>lt;sup>1</sup>Ohio Vocational Interest Survey: Student Report Folder (New York: Harcourt, Brace and World, Inc., 1969), p. 4.

in the various areas. The areas of grade point prediction and their related occupations are:

- 1. General Academic
- 2. General Vocational
- 3. Business Curriculum Area Bookkeeper, accountant Typist, stenographer Secretary, court reporter Bank clerk, office clerk Office machine operator Data-processing machine operator
- 4. Mechanics and Mechanical Maintenance Curriculum Area Automobile or Aircraft mechanic Air-conditioning and refrigeration mechanic Maintenance mechanic Business machine serviceman
- 5. Drafting and Design Curriculum Area Draftsman Industrial designer, Commercial artist Tool designer
- 6. Metal Trades Curriculum Area Machine tool operator, Machinist Tool and die maker Automobile body repairman Welder Sheet-metal worker
- 7. Home Economics and Health Curriculum Area Cook, chef, baker Sewing machine operator Dressmaker, tailor Medical technologist X-ray technician Practical nurse, registered nurse Dental assistant Barber, beautician
- 8. Construction Trades Curriculum Area Carpenter, cabinetmaker House painter Plasterer Bricklayer, cement mason, stonemason Plumber, pipefitter

- 9. Electronics and Electrical Trades Curriculum Area Electrician Electronics technician Electronic machine serviceman Telephone industry craftsman: equipment installer, repairman Appliance serviceman
- 10. Agriculture Curriculum Area Farm operator Nurseryman, florist.<sup>1</sup>

Machine scoring is done by Science Research Associates and is reported on a student report form showing predicted grade range as well as predicted grade point.

## Grade Point Averages (G.P.A.)

The grade point averages used in this study are the averages of all courses taken in the ninth grade by the students in the study. These grade point averages were made available through the G.I.S.D.

## Skill Center Vocational Course Grades

First semester grades in Skill Center vocational courses were collected for each member of the sample. Data presented in Table 3.2 indicates consistency of grades across marking periods. Grade changes from first semester

<sup>&</sup>lt;sup>1</sup>Vocational Planning Inventory: Your V.P.I. Report and What It Means (Chicago: Science Research Associates, Inc., 1968), p. 10.

## TABLE 3.2

First Semester Grade	Frequency	Second Semester Grade Distribution	Frequency
A	186	A	131
		В	44
		С	9
		D	1
		E	0
		W	1
- D		A	97
В	444	В	244
			92
			3
		W	0
		A	6
С	383	В	105
		с	197
		D	56
		E	12
		W	7
_	100	A	0
D	123	В	6
			50
			52
		L W	1
••••		A	0
Е	4	B	0
		С	1
		D	1
		E	2
		W	00
		<u>No.</u>	(%)
Grade stayed the	same	626	55.4
Moved up one gra	de	253	22.4
Moved down one g	rade	206	18.0
Moved up two gra	des	13	1.2
Moved down two g	rades	29	2.6
Moved more than	two grades	4	0.4
Totals		1,131	100.0
		_,	

## STUDENT GRADE CHANGES 1970-71

to second semester for 1970-71 Skill Center students are shown. The table shows that 95.8 percent of the students did not vary more than one letter grade across marking periods in the 1970-71 school year. Mr. Donald Bently, Deputy Principal of the Skill Center, stated that he would expect a similar consistency from year to year in Skill Center grades.

### Testable Hypotheses

The following hypotheses will be tested in the null form:

<u>Hypothesis 1</u>: There is no relationship between interests measured with the Ohio Vocational Interest Survey (O.V.I.S.) and grades received in Skill Center courses.

<u>Hypothesis 2</u>: There is no relationship between grades predicted by the Vocational Planning Inventory (V.P.I.) and grades received in Skill Center courses.

<u>Hypothesis 3</u>: There is no relationship between junior high school grade point average (G.P.A.) and grades received in Skill Center courses.

<u>Hypothesis 4</u>: There is no relationship between measured interest and measured aptitude as measured by the O.V.I.S. and the V.P.I.

<u>Hypothesis 5</u>: A combination of O.V.I.S. measured interest, V.P.I. measured aptitude, and previous grade point average will not predict grades in Skill Center courses at a higher level of significance than any of these indicators taken singly.

### Analysis Procedure

Data for this study was accumulated on two data cards for each student. A data list was first run of all juniors in the G.I.S.D. This list was then used to assign all eleventh graders at the Skill Center their G.I.S.D. student numbers. Harcourt, Brace and World provided a magnetic tape with all the O.V.I.S. scale scores from the ninth grade testing program by student number. V.P.I. scores and junior high grade point averages had been punched on data cards for use in the computer assisted guidance program. These data were then brought together on student cards which now have the following information:

- 1. School District number
- 2. Student number
- 3. Student name
- 4. Skill Center drop
- 5. Sex
- 6. Skill Center mark
- 7. Skill Center program
- 8. Home school
- 9. V.P.I. scores--(11)
- 10. O.V.I.S. scores--(24)
- 11. Junior high grade point average.

Not all of this information is used in this study. However, it was convenient to add it to the cards and might be useful in further analysis of the data.

Hypotheses one, two, and three will be investigated by correlating each of the O.V.I.S. scores, each of the V.P.I. scores, and the junior high grade point average with the grades received in each of the Skill Center programs. These correlations will be presented in appropriate tables for evaluation.

Hypothesis four will be investigated by correlating each of the O.V.I.S. scores with each of the V.P.I. scores. These correlations will be presented in a table for evaluation.

The "MDSTAT Program" developed by the Agricultural Extension Service at Michigan State University was selected to obtain correlations required for hypotheses one through four. The Pearson Product-Moment method of computing correlation is used in this program which was chosen because it allows correlations of data items where some of the observations have missing variables.

Hypothesis five will be investigated by running O.V.I.S., V.P.I., and grade point averages for the ninth grade in a multiple regression equation with Skill Center grade as the predictor variable.

The "LS Program" and the "LSADD Program" developed by the Agricultural Extension Service at Michigan State

University was selected to obtain the multiple regression correlations for hypothesis five. The least squares regression equation as used in the "LS Program" will not allow the number of independent variables to exceed the number of observations. The "LSAAD Program" was selected to determine the two most important O.V.I.S. and the two most important V.P.I. correlations. These selected correlations plus the junior high grade point correlations will then be used in the "LS Program" to produce the multiple regression correlations.

Coefficients of determination  $(r^2)$  will be used in the analysis. " $r^2_{xy}$  gives the proportion of the variance of y which is accounted for by x. . . When the r between y and x is .71,  $r^2$  is .50. Hence, an r of .71 means that 50% of the variance of y is associated with variability in x."<sup>1</sup>

The data for the study will be run on a Control Data Corporation 3600 computer located at Michigan State University.

<sup>&</sup>lt;sup>1</sup>Henry E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Company, 1961), p. 179.

#### Summary

A sample of 427 juniors geographically representing Genesee County Michigan was identified. These students now attend the Skill Center and their distribution in occupational preparation areas is shown in Table 3.1.

Each of the independent variables, O.V.I.S., V.P.I., and junior high grade point average were discussed in some detail. The dependent variable or Skill Center course grade was described with Table 3.2 illustrating the consistent nature of Skill Center grades across marking periods.

It was shown that O.V.I.S. scale scores are used as indicators of student interest strength and are specifically used to identify groups of students interested in specific vocational programs. Descriptions of each of the 24 O.V.I.S. classifications were presented. The close relationship of the O.V.I.S. coding system to that of the *Dictionary of Occupational Titles* was described as a linkage of particular value in the counseling process.

The V.P.I. was described as an aptitude battery whose purpose is to measure each student's own particular pattern of ability, aptitudes, achievement, and values to predict grade points. Grades are predicted in general academic, general vocational and in each of eight occupational areas. The eight occupational areas are described in some detail and the predicted grades in these eight areas are used as data in this study.

Grade point averages used in the study are the averages of all marks received in the ninth grade by each member of the sample.

Five hypotheses were stated in the null form for testing. All data necessary for the study was accumulated on two data cards. These data were used in the MDSTAT Program, LSADD Program, and the LS Program of Michigan State University in their Control Data Corporation 3600 computer. Correlations acquired in these programs will be used to test the hypotheses.

### CHAPTER IV

#### ANALYSIS OF THE RESULTS

The problem of investigating the predictive value of interests measured by the O.V.I.S., aptitudes measured by the V.P.I., and previous grade point average was specified in five hypotheses. The data relating to each of the five hypotheses are reported and separately analyzed in this chapter. All hypotheses are stated in null form for the purpose of statistical testing. Hypotheses one, two, three, and four were tested using analysis of correlation coefficients (r). Hypothesis five was tested using a least squares multiple regression equation. Coefficients of determination  $(r^2)$  will be used in the analysis.

Significance of correlations at the .10, .05, and .01 confidence levels was determined where appropriate using significance of correlation coefficient tables.<sup>1</sup> The level chosen for rejecting the null hypothesis in this study was .05.

O.V.I.S. and V.P.I. classifications were described in Chapter III and will be referred to by title in this

<sup>&</sup>lt;sup>1</sup>Fisher and Yates, Statistical Tables for Biological, Agricultural, and Medical Research (6th ed.; New York: Hafner Publishing Company, 1967), p. 63.

chapter. Skill Center programs are described from brochure materials<sup>1</sup> in the Hypothesis 1 analysis and will be referred to by name in subsequent sections.

Michael Shaffer, test editor of Harcourt Brace Jovanovich, Inc., provided charts showing relationships between O.V.I.S., V.P.I., and various Skill Center courses. Relationships not identified by Shaffer were suggested in consultation with counselors and others familiar with the instruments and programs under study. Table 4.1 presents these relationships and suggests the pattern of usage that would most likely be followed by counselors. These relationships will be referred to in the analysis of data.

### Hypothesis One

<u>Hypothesis 1</u>: There is no relationship between interests measured with the Ohio Vocational Interest Survey (O.V.I.S.) and grades received in Skill Center courses.

Correlation coefficients were computed using grades received in each of the twenty Skill Center occupational areas and scale scores in each of the twenty-four O.V.I.S. classifications. The correlations are presented in four tables, each table presenting data for five Skill Center occupational areas. Each of the four tables will be

<sup>&</sup>lt;sup>1</sup>Today's Students Prepare for Tomorrow, Genesee Area Skill Center, G-5081 Torrey Road, Flint, Michigan, 48507.

WATCH for D.H.P. From here on !

	COUNSELING RELATIONSHI	PS:	O.V.I.S., V.P.I., AND OCCUPATIONA	al area
	Skill Center			
	Occupational Area	0°V.	I.S. Classification	V.P.I. Curriculum Area
-		ſ		
•	THE TOTAL	• o r	LLAIUS ANG FLECISE Nytistis	o. Dratting & Design
ſ	Auchitoct Durrian		AL LISUTO	
7	Architect Urawing	۲. ۲.	Numerical	5. Dratting & Design
		14.	Appraisal	
		16.	Applied Technology	
т. М	Mechanical Drawing	13.	Numberical	5. Drafting & Design
		14.	Appraisal	
		16.	Applied Technology	
4.	Graphic Arts	2.	Machine Work	4. Mechanics & Maint.
		.9	Inspecting, Testing	
		7.	<b>Crafts and Precise</b>	
		18.	Management	
5.	Intensive Office	5.	Clerical Work	3. Business
		17.	Promotion, Communication	
		18.	Management	:
6.	Data Process	2.	Machine Work	3. Business
		5.	Clerical Work	
		7.	<b>Crafts and Precise</b>	
		8.	Customer Services	
		13.	Numerical	
7.	Health Occupations	4.	Caring for People	7. Home Ec. & Health
		.6	Nursing, Rel. Tech.	
8.	Auto Mechanics	1.	Manual Work	4. Mechanics & Maint.
		7.	Crafts and Precise	
9.	Auto Body Mechanics	1.	Manual Work	4. Mechanics & Maint.
		2.	Machine Work	6. Metal Trades
		7.	<b>Crafts and Precise</b>	
		14.	Appraisal	

TABLE 4.1
10.	Truck Mechanics	<b>г</b>	Manual Work	4.	Mechanics & Maint.
		7.	Crafts and Precise		
	Small Engine Mechanics	1.	Manual Work	4.	Mechanics & Maint.
		7.	Crafts and Precise		
12.	Aviation	1.	Manual Work	4.	Mechanics & Maint.
		7.	Crafts and Precise	6.	Metal Trades
13.	Machine Occupations	1.	Manual Work	<b>.</b> 9	Metal Trades
		2.	Machine Work		
		7.	<b>Crafts and Precise</b>		
		18.	Management		
14.	Electronics Occupations	<b>1</b> .	Manual Work	6	Electron. &
		7.	Crafts and Precise		Electric.
		18.	Management		
15.	Welding	г.	Manual Work	<b>.</b>	Metal Trades
		2.	Machine Work		
		7.	Crafts and Precise		
16.	Heating & Cooling	1.	Manual Work	4.	Mechanics & Maint.
		6.	Inspecting, Testing		
		7.	Crafts and Precise		
17.	House Construction	1.	Manual Work	æ	Customer Services
		7.	<b>Crafts and Precise</b>		
		14.	Appraisal		
18.	Floriculture	15.	Agriculture	10.	Agriculture
		19.	Artistic		
		20.	Sales Representative		
19.	Landscaping	ι.	Manual Work	10.	Agriculture
		15.	Agriculture		
20.	Cosmetology	Э.	Personal Services	7.	Home Ec. & Health
		7.	Crafts and Precise		
		10.	Skilled Personal		
		18.	Management		

accompanied by brief descriptions of the respective Skill Center programs and analysis of the data.

## Commercial Art

This program trains students in commercial art theory and practice. Methods, tools, and media of the profession are covered including lettering, layout, keylining, signs, posters, show cards, line drawing, tone drawing, color, perspective, enlarging, display reproduction and technical illustration. In the second year of the program students are allowed to specialize in particular disciplines of commercial art based on their natural ability and unique interests.

O.V.I.S. scale score correlations (r) with grades received in Commercial Art are shown in column one of Table 4.2. All r's were negative. O.V.I.S. Classifications 7 and 19 were identified as being related to Commercial Art, however, neither of these classifications were found to correlate significantly with grades received in Commercial Art.

Ten r's, however, were found to be significantly less than zero at the .05 confidence level. There were more significant r's found for Commercial Art than for any of the other occupational areas studied. Coefficients of determination for the ten significant correlations are reported in Table 4.3.

			Skill C	Center Occupationa	ıl Area	
0 <b>. v</b> .	.I.S. Classifications	Commercial Art	Architect. Drawing	Mechanical Drawing	Graphic Arts	Intensive Office
-:	Manual Work	-0.237	+0.457	+0.047	-0.054	+0.024
2	Machine Work	-0.175	+0.450	+0.343	-0.101	000.0
т т	Personal Services	-0.571*	+0.378	-0.184	-0.050	+0.125
4.	Caring for People	-0.087	+0.022	-0.185	+0.016	-0.046
ۍ ۲	Clerical Work	-0.577*	+0,168	-0.191	+0.001	-0.188
<b>.</b> 0	Inspecting, Testing	-0.470	+0.267	-0.021	-0.049	-0.022
7.	<b>Crafts and Precise</b>	-0.151	+0.267	+0.150	-0.166	-0.025
ω.	Customer Services	-0°609*	+0.146	+0.028	+0.036	960 • 0+
<u>б</u>	Nursing, Rel. Tech.	-0.202	+0.175	-0.209	-0.269	+0.084
10.	Skilled Personal	-0.527	+0.281	-0.221	000.0	-0.180
	Training	-0.393	+0.410	+0.394	+0,007	+0.180
12.	Literary	-0.538*	-0.021	-0.168	-0.174	+0.053
13.	Numerical	-0.551*	+0.315	+0.148	-0.235	+0.049
14.	Appraisal	-0.351	+0.016	+0.029	-0.274	+0.021
15.	Agriculture	-0.027	+0.381	-0.012	-0.115	000.0
16.	Applied Technology	-0.237	+0.018	+0.132	-0.381	000 • 0
17.	Promotion, Commun.	-0.687*	-0.055	-0.126	-0.186	+0.141
18.	Management	-0.669*	+0.012	-0.127	-0.281	+0.116
19.	Artistic	-0.091	-0.278	-0.221	-0.023	+0.057
20.	Sales Representative	-0.482	+0°040	+0.091	-0.132	+0*060
21.	Music	-0.711*	+0.111	-0.297	-0.100	+0.147
22.	Entertainment	-0.679*	-0.130	-0.061	-0.154	+0.179
23.	Teaching, Soc. Work	-0.602*	+0.156	-0.212	-0.138	0.000
24.	Medical	-0.160	+0.069	-0.203	-0.217	-0.031

level.
confidence
.05
the
at
zero
below
οr
above
significantly
*Correlation

TABLE 4.2

SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES

#### TABLE 4.3

0. <b>v</b> .	I.S. Classification	r	r²
3.	P <b>erson</b> al Services	-0.571	.33
5.	Clerical Work	-0.577	.34
8.	Customer Services	-0.609	.37
12.	Literary	-0.538	.29
13.	Numerical	-0.551	.30
17.	Promotion, Communication	-0.687	.47
18.	Management	-0.669	.45
21.	Music	-0.711	.50
22.	Entertainment	-0.679	.46
23.	Teaching, Social Work	-0.602	.36

## COMMERCIAL ART AND O.V.I.S. COEFFICIENTS OF DETERMINATION (r<sup>2</sup>) FOR SIGNIFICANT CORRELATIONS

Music was found to be the best predictor with a correlation of -0.711. This correlation is significant at better than the .02 confidence level; meaning that a correlation as high as this could be expected to occur by chance in two cases out of a hundred. The  $r^2$  of .50 indicates that 50 percent of the variance in the Commercial Art grade is associated with the variability in the O.V.I.S. music scale score.

The ten significant correlations at the .05 level are sufficient evidence to reject Hypothesis 1 as it relates to Commercial Art. It is noted, however, that all of the correlations were negative and the two O.V.I.S. classifications reported (Table 4.1) to have relationships with Commercial Art did not produce significant correlations.

# Architectural Drawing

This program provides training for students in all areas of the architectural profession including: techniques with construction documents, color presentations, live presentations, model construction methods, and graphic communication materials.

0.V.I.S. scale score correlations with grades received in Architectural Drawing are shown in column two of Table 4.2. No correlations were found to be significant at the .05 level, which does not allow the rejection of Hypothesis 1 as it relates to Architectural Drawing.

## Mechanical Drawing

This program trains students in the three mechanical drawing areas of die design principles, technical illustration, and product design principles. Students acquire experiences with assembly drawings, detail drawings, part prints, layouts, sketches, schematics, fabrication problems, assembly procedures, manual illustrations and assembly illustrations. Design shop detailing in conjunction with industry is encouraged.

0.V.I.S. scale score correlations with grades received in Mechanical Drawing are shown in column three of Table 4.2. No correlations were found to be significant at the .05 level. Hypothesis 1 could not be rejected as it relates to Mechanical Drawing.

### Graphic Arts

Students in this program are introduced to a wide variety of related occupations and given skill development experiences in the following areas: job planning and layout, hot metal composition, letterpress, cold composition, paste up, continuous line and halftone photography, stripping a flat, offset presswork, platemaking, trouble shooting, binding, electrostatic printing, color reproduction and management practices.

O.V.I.S. scale score correlations with grades received in Graphic Arts are shown in column four of Table 4.2. Hypothesis 1 as it relates to Graphic Arts could not be rejected since no correlations were found to be significant at the .05 level.

## Intensive Office

This is an individualized instructional program which develops business office skills as students rotate through simulated office experiences such as: order clerk, shipping clerk, billing and pricing clerk, secretary, executive secretary, and office manager. Students also acquire skills with a variety of office machines.

0.V.I.S. scale score correlations (r) with grades received in Intensive Office are shown in column five of Table 4.2. Hypothesis 1 could not be rejected as it relates to Intensive Office since no correlations at the .05 level were found.

#### Data Processing

This program develops skills in accounting, business communications, data processing math, principles of data processing, unit record machine operations, computer operations, and COBOL programming and other languages, advanced programming techniques and cost accounting. An I.B.M. 1130 computer is utilized in the instructional program.

O.V.I.S. scale score correlations with grades received in Data Processing are reported in column one of Table 4.4. Hypothesis 1 could not be rejected as it relates to Data Processing when no correlations were found significant at the .05 level.

#### Health Occupations

This program provides students with the fundamentals of nursing and explores other para medical occupations. Approximately two-fifths of the student's time is spent working with patients at various medical facilities. Advanced placement is provided at the post-secondary level in Licensed Practical Nurse Programs.

ł			Skill (	Center Occupation	al Area	
0 <b>.V</b> .	I.S. Classifications	Data Process	Health Occ.	Auto Mech.	Auto Body	Truck Mech.
-:	Manual Work	-0.201	-0.005	+0.051	+0.546*	+0.114
5	Machine Work	+0.060	-0.137	+0.202	+0.122*	+0.399
т М	Personal Services	-0.266	-0.064	-0.006	+0°004	+0.282
4.	Caring for People	-0.176	-0.036	+0*038	+0.085	+0.253
2. 2	Clerical Work	-0.030	+0.362	+0.059	+0.265	+0.381
<b>.</b>	Inspecting, Testing	-0.081	-0.287	+0.188	+0.146	+0.207
7.	Crafts and Precise	-0.033	-0.115	+0.158	+0.479*	+0.393
8.	Customer Services	-0.084	+0.175	+0*080	+0.232	+0.454
<b>.</b> 6	Nursing, Rel. Tech.	-0.016	+0.019	+0.136	-0.091	+0.084
10.	Skilled Personal	-0.207	-0.050	+0.018	-0.060	+0.273
11.	Training	-0.031	-0.105	+0.115	+0.340	+0.384
12.	Literary	-0.184	-0.032	+0.031	+0.062	+0.228
13.	Numerical	+0.208	-0.001	+0.302	+0.176	+0.453
14.	Appraisal	+0.163	-0.217	+0.270	+0.272*	+0.495
15.	Agriculture	+0.040	-0.205	+0.406*	+0.061	+0.254
16.	Applied Technology	+0.170	-0.230	+0.150	+0.140	+0.508
17.	Promotion, Commun.	-0.286	+0*006	+0.013	+0.113	+0.364
18.	Management	+0.165	+0.119	+0*039	+0.297	+0.476
19.	Artistic	-0.125	-0.288	+0.040	+0.209	+0.180
20.	Sales Representative	+0.245	+0.001	+0.092	+0.217	+0.481
21.	Music	-0.323	-0.076	-0.165	-0.067	+0.008
22.	Entertainment	-0.252	-0.171	+0.047	-0.229	+0.090
23.	Teaching, Soc. Work	-0.248	+0.189	+0.026	-0.062	+0.252
24.	Medical	-0.099	-0.038	+0.109	+0.091	+0.282

SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES

TABLE 4.4

\*Correlation significantly above or below zero at the .05 confidence level.

0.V.I.S. scale score correlations with grades received in Health Occupations are shown in column two of Table 4.4. No correlations were found significant at the .05 level, hence, Hypothesis 1 was not rejected as it relates to Health Occupations.

#### Auto Mechanics

This program allows students to develop auto mechanics skills in the areas of: engine tune up, electrical and fuel systems, brakes, suspension systems, major engine repair, carburetion, cooling systems, transmissions, differentials and alignment. The second year of the program is essentially service oriented with students working on field cars as opposed to laboratory components.

0.V.I.S. scale score correlations with grades received in Auto Mechanics are shown in column three of Table 4.4. O.V.I.S. Classification Agriculture (15) was found to have a correlation of .406 with grade received in Auto Mechanics. This correlation is above the .05 level of significance and produces an  $r^2$  of .16. Hypothesis 1 was rejected as it relates to Auto Mechanics. The correlation is, however, not found in either of the two classifications 1 or 7 identified as relating to Auto Mechanics.

### Auto Body Mechanics

Students in this program develop skills in all types of body and chassis repair including: roughing, bumping, metal finishing, replacement of panels, frame straightening, welding, torch soldering and heat shrinking, and trim and hardware mechanics. Students move from initial experiences with components to the servicing of automobiles.

O.V.I.S. scale score correlations with grades received in Auto Body Mechanics are shown in column four of Table 4.4. O.V.I.S. classifications 1, 2, 7, and 14 were identified as having relationships with Auto Body Mechanics. Manual Work (1) had a correlation of .546 significant at the .05 level. Crafts and Precise Operations (7) had a correlation of .479 significant at the .10 level. O.V.I.S. classifications 2 and 14 did not have significant correlations. Hypothesis 1 was rejected as it relates to Auto Body Mechanics since one correlation was found significant at better than the .05 level.

#### Truck Mechanics

This program develops skills in all aspects of the repair of light and heavy trucks. The mechanical systems of auto mechanics are covered as they relate to trucks with both gasoline and diesel engines. Most instruction is provided through work on field vehicles.

O.V.I.S. scale score correlations with grades received in Truck Mechanics are shown in column five of Table 4.4. No correlations were found at the .05 level of significance. Therefore, Hypothesis 1 could not be rejected as it relates to Truck Mechanics.

#### Small Engine Mechanics

This program provides training in the repair and maintenance of all types of small engines and equipment including lawnmowers, snowblowers, scooters, motorcycles, outboard engines, snowmobiles, and small tractors. Service skills of the basic engine, ignition systems, carburetion, and various power trains are developed. Field units are used for laboratory experiences.

0.V.I.S. scale score correlations with grades received in Small Engine Mechanics are shown in column one of Table 4.5. No correlations appeared at the .05 level of significance. Therefore, Hypothesis 1 could not be rejected as it relates to Small Engine Mechanics.

## Aviation Mechanics

Students in this program are trained as apprentice aviation mechanics with primary emphasis on the airframe. Program content includes: theory of flight, Federal Aviation regulations, airframe structure, welding, hydraulic systems, electrical systems, flight instruments, landing gear, fabric and metal coverings, and painting and finishing.

			Skill	Center Occupationa	.l Area	
0 <b>.</b> V.	I.S. Classifications	Small Engine	Aviation	Machine Occ.	Electronics Occ.	Welding
-:	Manual Work	+0.097	-0.001	+0.061	+0.048	+0.059
2.	Machine Work	+0.166	+0.276	+0,080	+0.027	+0.177
т М	<b>Personal Services</b>	-0.120	+0.072	-0.268	+0.014	+0.648
4.	Caring for People	-0.437	+0.247	-0.398	-0.047	+0.164
5.	Clerical Work	-0.226	+0.077	-0.314	-0.008	+0.080
6.	Inspecting, Testing	-0.107	+0.072	-0.171	-0.038	+0.098
7.	<b>Crafts and Precise</b>	-0.035	+0.445	-0.230	+0.128	+0.179
8.	Customer Services	-0.252	+0.194	-0.089	+0.111	+0.270
.6	Nursing, Rel. Tech.	-0.294	+0.163	-0.280	+0.043	+0.036
10.	Skilled Personal	+0.041	+0.035	-0.189	+0.047	+0.423
11.	Training	+0.173	+0.339	-0.437	+0*030	+0.329
12.	Literary	-0.394	+0• 000	-0.251	+0.087	+0.297
13.	Numerical	+0.017	+0.252	-0.042	+0.195	-0.301
14.	Appraisal	-0.319	+0.507	-0.211	+0.159	0.000
15.	Agriculture	-0.120	+0.259	-0.248	-0.026	-0.011
16.	Applied Technology	-0.353	+0.435	-0.304	+0.136	+0.685
17.	Promotion, Commun.	-0.236	+0.226	-0.239	+0.111	-0.119
18.	Management	-0.076	+0.253	+0.026	+0.074	+0.205
19.	Artistic	-0.273	+0.157	-0.721*	-0.101	+0.485
20.	Sales Representative	-0.366	+0.281	-0.161	+0.188	-0.166
21.	Music	-0.382	-0.074	-0.323	+0.044	+0.771*
22.	Entertainment	-0.252	-0.250	-0.501	-0.007	+0.874*
23.	Teaching, Soc. Work	-0.427	+0.053	-0.355	+0.033	+0.278
24.	Medical	-0.403	+0.030	-0.315	+0.051	+0.156

SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES

TABLE 4.5

73

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A variety of experiences are provided on field aircraft brought into the laboratory.

O.V.I.S. scale score correlations with grades received in Aviation Mechanics are shown in column two of Table 4.5. Hypothesis 1 could not be rejected as it relates to Aviation Mechanics when no correlations were found significant at the .05 level.

### Machine Occupations

This program develops skills in a number of machine related occupations including: set-up and operation of vertical and horizontal milling machines, drill presses, lathes, and various types of grinders. Students are taught the use of precision tools and instruments, blue print reading, shop mathematics, inspection procedures, heat treat theory, jig and fixture construction and the latest machine techniques.

O.V.I.S. scale score correlations with grades received in Machine Occupations are shown in column three of Table 4.5. None of the O.V.I.S. classifications identified as having relationships with Machine Occupations were found to be significant. The Artistic Classification (19) was, however, found to have a correlation of -0.721 which is significant at better than the .01 level. The  $r^2$  of .51 indicates that 51 percent of the variance in the Machine Occupations grade is associated with variability in the

O.V.I.S. Artistic scale score. With a correlation significance level of better than .05, Hypothesis 1 was rejected for Machine Occupations.

# Electrical and Electronics Occupations

The initial portion of this instructional area provides fundamental instruction in electricity and electronics from which students move to specialize in one of four specific programs. The programs are Electrical Occupations, Radio and T.V. Service, Electronics Communication and Domestic Appliance Service. All students in these related programs were grouped for the purposes of this study.

The Electrical Occupations Program includes: tube theory, low voltage wiring, electrical blueprint reading, electrical planning, electrical codes, residential wiring, motors and industrial controls. Field experiences are provided in the above areas including the wiring of the homes constructed in the House Construction Program.

The Radio and T.V. Service Program includes tube and transistor theory in conjunction with field service on the following: radio, black and white and color T.V., phonographs and tape recorders.

The Electronics Communications Program develops the skills needed to obtain a second class Federal Communications Commission Commercial License. The servicing of V.H.F. F.M. equipment and solid state circuits is stressed.

Domestic Appliance Service provides instruction and practice in all phases of household appliance repair such as: automatic washers, dryers, stoves, dishwashers, vacuum cleaners as well as small appliances.

O.V.I.S. scale score correlations with grades received in Electrical and Electronics Occupations are shown in column four of Table 4.5. No correlations were found significant at the .05 level. Therefore, Hypothesis 1 was not rejected as it relates to Electricity and Electronics Occupations.

#### Welding

Students in this program develop skills in both gas and arc welding. Experiences are provided in machine and gas cutting of materials, inert gas welding, wire welding, and fabrication as well as basic gas and arc all position welding. Types of weldments, electrodes, symbols, and fundamentals of metalurgy are studied.

0.V.I.S. scale score correlations with grades received in Welding are reported in column five of Table 4.5. Two correlations were found significant at better than the .05 level. Music (21) with a correlation of +0.771 yields an  $r^2$  of .59 and entertainment with a correlation of +0.874 yields an  $r^2$  of .76. Indications are that these could be used as predictors. However, neither was identified as having relationships with Welding and are probably not used in the counseling process in connection with Welding. Hypothesis 1 was rejected as it relates to Welding.

#### Heating and Cooling Mechanics

Students in this program learn the fundamentals of heating, air cleaning, humidifying, de-humidifying and cooling of environmental air. Training is provided in the use and maintenance of refrigerants, compressors, receivers, metering devices, evaporators, electrical controls and valves; electric motors, starters, and protective devices. Students learn to calculate heat loss and duct capacity.

0.V.I.S. scale score correlations with grades received in Heating and Cooling Mechanics are reported in column one of Table 4.6. Appriasal (14) was found to have a correlation significant at better than the .05 level. The .520 Appraisal (14) correlation yields an  $r^2$  of .27. Hypothesis 1 was rejected as it relates to Heating and Cooling Mechanics.

### House Construction

This is an on the job training program where students meet on site for the actual construction of a house. The program provides the opportunity to develop skills in all phases of house construction including: rough carpentry, finish carpentry, painting and landscaping of the completed project. Students explore related sub-contracting occupations by working with them at the appropriate times.

			Skill (	Center Occupationa	.l Area	
0 <b>.V</b> .	I.S. Classifications	H <b>ea</b> ting & Cooling	House Construction	Floriculture	Landscaping	Cosmetology
-:	Manual Work	-0.200	+0.099	-0.093	+0.505	+0.159
2.	Machine Work	+0.044	+0.083	-0.238	+0.582	+0.233
m.	Personal Services	-0.289	+0.149	-0.445	+0.430	+0.010
4	Caring for People	-0.163	-0.124	-0.163	-0.073	+0.082
ۍ ۱	Clerical Work	+0.175	+0.055	-0.310	+0.422	+0.086
6.	Inspecting, Testing	-0.004	+0.234	-0.173	+0.511	+0.301
7.	Crafts and Precise	+0.426	+0.141	-0.126	+0.409	+0.189
ω.	Customer Services	-0.167	+0.201	-0.374	+0.431	+0.082
<u>е</u>	Nursing, Rel. Tech.	-0.095	-0.123	-0.379	+0.135	+0.090
10.	Skilled Personal	+0.144	+0.110	-0.451	+0.227	+0.271
1.	Training	+0.155	+0.111	-0.302	+0.566	+0.318
12.	Literary	-0.125	+0.055	-0.297	+0.406	+0.203
13.	Numerical	+0.289	+0.004	-0.198	+0.087	+0.315
14.	Appraisal	+0.520*	+0.084	-0.311	+0.171	+0.402*
15.	Agriculture	-0.002	+0.117	+0.075	+0.401	+0.201
16.	Applied Technology	+0.464	+0.072	-0.348	-0.016	+0.073
17.	Promotion, Commun.	-0.099	-0.012	-0.369	+0.099	+0.169
18.	Management	+0.087	+0.116	-0.465	+0.288	+0.280
19.	Artistic	+0.282	+0.145	-0.070	+0.164	+0.212
20.	Sales Representative	+0.351	+0.078	-0.392	+0.323	+0.391*
21.	Music	-0.372	+0.037	-0.637*	-0.242	+0.260
22.	Entertainment	-0.153	-0.009	-0.518*	+0.002	+0.095
23.	Teaching, Soc. Work	+0.129	+0.040	-0.267	+0.100	-0.023
24.	Medical	+0.110	-0.116	-0.459	-0.085	+0.300

\*Correlation significantly above or below zero at the .05 confidence level.

78

SKILL CENTER GRADE CORRELATIONS WITH O.V.I.S. SCALE SCORES

O.V.I.S. scale score correlations with grades received in House Construction are reported in column two of Table 4.6. Hypothesis 1 could not be rejected as it relates to House Construction.

## Floriculture

This program includes the basic concepts of design, arranging color, form and materials, mechanics of arranging flowers, preservation of specimens, skills in flower arranging, floral decorations, flower show principles and feather fashions. Experiences are provided in greenhouse operation and management, retail store operation, plant propagation, and wholesaling.

0.V.I.S. scale score correlations with grades received in Floriculture are reported in column three of Table 4.6. Two correlations were found at the .05 level of significance. Music (21) with a correlation of .637 yields an  $r^2$  of .41, and Entertainment (22) with a correlation of .518 yields an  $r^2$  of .27. Indications are that these two scores in conjunction could be of value in prediction. Neither one of these significant measures were identified as having relationships with Floriculture, therefore they are probably not used in the counseling process. Hypothesis 1 was rejected as it relates to Floriculture.

## Landscape Horticulture

This program develops skills in plant identification, turf-grass maintenance, plant propagation, greenhouse production, bedding plant production, landscape design, landscape construction, aboriculture, nursery production, and small engine maintenance and repair.

O.V.I.S. scale score correlations with grades received in Landscape Horticulture are reported in column four of Table 4.6. No correlations were found significant at the .05 level. Hypothesis 1 could not be rejected as it relates to Landscape Horticulture.

## Cosmetology

This is a state licensed program requiring 1500 hours of training. Students study the science and skills necessary for the care of the hair, nails, and skin. Students learn the techniques of cutting, styling, and waving of the hair as well as facial treatment and application of cosmetics.

0.V.I.S. scale score correlations with grades received in Cosmetology are shown in column five of Table 4.6. Two correlations were found to be significant above the .05 level. Appraisal (14) with a correlation of .402 yields an  $r^2$  of .16 and Sales Representative (20) with a correlation of .391 yields an  $r^2$  of .15. Indications are that these two classifications could be of value in prediction but probably are not used that way since they were not

identified as having relationships with Cosmetology. Hypothesis 1 was rejected as it relates to Cosmetology.

### Summary

<u>Hypothesis 1</u>: There is no relationship between interests measured with the Ohio Vocational Interest Survey (O.V.I.S.) and grades received in Skill Center courses-could not be rejected in the following twelve Skill Center Occupational Areas:

- 1. Architectural Drawing
- 2. Mechanical Drawing
- 3. Graphic Arts
- 4. Intensive Office
- 5. Data Processing
- 6. Health Occupations
- 7. Truck Mechanics
- 8. Small Engine Mechanics
- 9. Aviation Mechanics
- 10. Electricity and Electronics Occupations
- 11. House Construction
- 12. Landscaping.

No significant relationships (.05) were found between O.V.I.S. measured interests and grades received in these programs. The evidence indicates that the O.V.I.S. measured interests would not be of value in the prediction of success for these programs.

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Hypothesis 1 was rejected in eight of the Skill Center occupational areas. A summary of significant O.V.I.S. scale score and Skill Center grade correlations with the respective  $r^2$ 's is shown in Table 4.7. It appears that O.V.I.S. measured interest would be of value for predicting success in the eight areas summarized in Table 4.7. The high  $r^2$  of .76 for Entertainment in Welding indicates that a counselor might be right in 76 cases out of a hundred in predicting success in welding based on a high O.V.I.S. scale score in Entertainment alone.

Of the twenty correlations found significant at the .05 level, only one was consistent with the relationships suggested in Table 4.1; Manual Labor in Auto Body Mechanics. Thirteen of the twenty significant correlations were negative.

# Hypothesis Two

<u>Hypothesis 2</u>: There is no relationship between grades predicted by the Vocational Planning Inventory (V.P.I.) and grades received in Skill Center courses.

Correlation coefficients were computed using grades received in each of the twenty Skill Center occupational areas and predicted grades in each of ten V.P.I. curriculum areas. The correlations are presented in four tables, each table presenting data for five Skill Center occupational TABLE 4.7

SUMMARY OF SIGNIFICANT O.V.I.S. SCALE SCORE AND SKILL CENTER GRADE CORRELATIONS

1. Commercial Arts       3. Personal         5. Clerical       8. Customer         8. Customer       12. Literary         13. Numerica       13. Numerica         13. Numerica       13. Numerica         13. Numerica       13. Promotio         13. Numerica       13. Promotio         13. Numerica       13. Promotio         13. Auto Mechanics       21. Music         2. Auto Mechanics       15. Agricult         3. Auto Body Mechanics       1. Manual W         4. Machine Occupations       19. Artistic         5. Welding       21. Music         6. Heating and Cooling       14. Appraisa         7. Floriculture       21. Music         8. Cosmetology       21. Music	0.V.	I.S. Classification	н	r.2	Number
<ol> <li>Clerical</li> <li>Customer</li> <li>Literary</li> <li>Numerica</li> <li>Numerica</li> <li>Numerica</li> <li>Promotio</li> <li>Numerica</li> <li>Auto Machanics</li> <li>Auto Machanics</li> <li>Auto Machanics</li> <li>Auto Machanics</li> <li>Auto Machanics</li> <li>Autistic</li> <li>Autistic</li> <li>Autistic</li> <li>Autistic</li> <li>Autistic</li> <li>Autistic</li> <li>Autistic</li> <li>Auto and Cooling</li> <li>Heating and Cooling</li> <li>Autistic</li> <li>Pusic</li> <li>Scheting and Cooling</li> <li>Autistic</li> <li>Scheting and Cooling</li> <li>Autistic</li> <li>Scheting and Cooling</li> <li>Autistic</li> <li>Scheting and Cooling</li> <li>Autistic</li> <li>Scheting</li> <li>Cosmetology</li> <li>Autistic</li> </ol>	Э.	Personal Services	-0.571	• 33	14
8.       Customer         12.       Literary         13.       Numerica         13.       Numerica         13.       Numerica         13.       Numerica         13.       Numerica         13.       Numerica         14.       Machine         2.       Auto Mechanics       15.         3.       Auto Body Mechanics       1.         4.       Machine Occupations       19.       Artistic         5.       Welding       21.       Music         6.       Heating and Cooling       14.       Appraisa         7.       Floriculture       21.       Music         8.       Cosmetology       14.       Appraisa	<b>5</b>	Clerical Work	-0.577	.34	
12.       Literary         13.       Numerica         17.       Promotio         17.       Promotio         18.       Manageme         21.       Music         22.       Entertai         23.       Teaching         24.       Machine Occupations       15.         3.       Auto Body Mechanics       1.       Manual W         4.       Machine Occupations       19.       Artistic         5.       Welding       21.       Music         6.       Heating and Cooling       14.       Appraisa         7.       Floriculture       21.       Music         8.       Cosmetology       14.       Appraisa	.8	Customer Services	-0.609	.37	
13. Numerica         17. Promotio         17. Promotio         18. Manageme         21. Music         21. Music         22. Entertai         23. Teaching         23. Teaching         24. Machine Occupations       15. Agricult         4. Machine Occupations       19. Artistic         5. Welding       21. Music         6. Heating and Cooling       14. Appraisa         7. Floriculture       21. Music         8. Cosmetology       14. Appraisa	12.	Literary	-0.538	. 29	
17.       Promotio         18.       Manageme         21.       Music         22.       Entertai         23.       Teaching         24.       Mato Mechanics       15.         3.       Auto Mechanics       1.         4.       Machine Occupations       19.       Artistic         5.       Welding       21.       Music         6.       Heating and Cooling       14.       Appraisa         7.       Floriculture       21.       Music         8.       Cosmetology       14.       Appraisa	13.	Numerical	-0.551	.30	
18.       Manageme         21.       Music         22.       Entertai         23.       Teaching         24.       Machine Occupations       15.         3.       Auto Body Mechanics       1.       Manual W         4.       Machine Occupations       19.       Artistic         5.       Welding       21.       Music         6.       Heating and Cooling       14.       Appraisa         7.       Floriculture       21.       Music         8.       Cosmetology       14.       Appraisa	17.	Promotion, Commun.	-0.687	.47	
21. Music22. Entertai22. Entertai23. Teaching24. Muto Body Mechanics15. Agricult3. Auto Body Mechanics1. Manual W4. Machine Occupations19. Artistic5. Welding21. Music6. Heating and Cooling14. Appraisa7. Floriculture21. Music8. Cosmetology14. Appraisa	18.	Management	-0.669	.45	
22. Entertai23. Teaching2. Auto Mechanics2. Auto Body Mechanics3. Auto Body Mechanics4. Machine Occupations5. Welding6. Heating and Cooling7. Floriculture8. Cosmetology8. Cosmetology14. Appraisa	21.	Music	-0.711	.51	
23. Teaching2. Auto Mechanics15. Agricult3. Auto Body Mechanics1. Manual W4. Machine Occupations19. Artistic5. Welding21. Music6. Heating and Cooling14. Appraisa7. Floriculture21. Music8. Cosmetology14. Appraisa	22.	Entertainment	-0.679	.46	
2. Auto Mechanics15. Agricult3. Auto Body Mechanics1. Manual W4. Machine Occupations19. Artistic5. Welding21. Music6. Heating and Cooling14. Appraisa7. Floriculture21. Music8. Cosmetology14. Appraisa	23.	Teaching, Soc. Work	-0.602	.36	
3. Auto Body Mechanics1. Manual W4. Machine Occupations19. Artistic5. Welding21. Music6. Heating and Cooling14. Appraisa7. Floriculture21. Music8. Cosmetology14. Appraisa	15.	Agriculture	+0.406	.16	29
4. Machine Occupations19. Artistic5. Welding21. Music6. Heating and Cooling14. Appraisa7. Floriculture21. Music8. Cosmetology14. Appraisa	cs I.	Manual Work	+0.546	.30	15
5. Welding21. Music22. Entertai6. Heating and Cooling7. Floriculture21. Music8. Cosmetology14. Appraisa	ns 19.	Artistic	-0.721	.51	14
22. Entertai6. Heating and Cooling14. Appraisa7. Floriculture21. Music8. Cosmetology14. Appraisa	21.	Music	+0.771	.59	ω
6. Heating and Cooling14. Appraisa7. Floriculture21. Music22. Entertai8. Cosmetology14. Appraisa	22.	Entertainment	+0.874	.76	
<ol> <li>Floriculture</li> <li>21. Music</li> <li>22. Entertai</li> <li>8. Cosmetology</li> <li>14. Appraisa</li> </ol>	ng 14.	Appraisal	+0.520	.27	18
8. Cosmetology 14. Appraisa	21.	Music	-0.637	.41	16
8. Cosmetology 14. Appraisa	22.	Entertainment	-0.518	.27	
	14.	Appraisal	+0.402	.16	28
20. Sales Re	20.	Sales Represent.	+0.391	.15	

areas. Each of the four tables will be accompanied by a corresponding analysis of that data.

### Commercial Art

V.P.I. grade prediction correlations with grades received in Commercial Art are shown in columns one of Table 4.8. A correlation of .532 is necessary for significance at the .05 level of confidence. No correlations were found to be significant at the .05 level of confidence. Hypothesis 2 could not be rejected in regard to Commercial Art.

## Architectural Drawing

V.P.I. grade prediction correlations with grades received in Architectural Drawing was shown in column two of Table 4.8. No correlations were identified at the .05 confidence level of significance. Hypothesis 2 was not rejected as it relates to Architectural Drawing.

### Mechanical Drawing

V.P.I. grade prediction correlations with grades received in Mechanical Drawing are shown in column three of Table 4.8. V.P.I. predicted grade in Home Economics and Health (7) was found to have a correlation with grade received in Mechanical Drawing at the .05 significance level. The correlation of .561 yields an  $r^2$  of .32. Hypothesis 2 was rejected as it relates to Mechanical

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			Skill C	enter Occupationa	l Area	
V.P.	I. Curriculum Area	Commercial Art	Architect. Drawing	Mechanical Drawing	Graphic Arts	Intensive Office
г.	General Academic	-0.194	+0.241	+0.415	+0.219	+0.315
2.	General Vocational	-0.229	+0.142	+0.425	+0.328	+0.225
м.	Business	-0.242	+0.192	+0.347	+0.433*	+0.244
4.	Mechanics & Maint.	+0.108	-0.225	+0.446	+0.121	+0.025
5.	Drafting & Design	-0.355	-0.183	+0.397	+0.483*	+0.010
6.	Metal Trades	+0.423	-0.169	+0.071	+0.014	-0.006
7.	Home Ec. & Health	-0.391	+0.095	+0.561*	+0.358	+0.247
8.	Construction Trades	+0*066	-0.136	+0.206	+0.303	+0.071
9.	Electron. & Electric.	+0.043	-0.076	+0.171	+0•060	+0.144
10.	Agriculture	+0.077	+0.085	+0.401	-0.024	+0.317

<sup>\*</sup>Correlation significantly above or below zero at the .05 confidence level.

Drawing. This correlation is not consistent with the V.P.I. Drafting and Design Curriculum Area identified in Table 4.1 as relating to Mechanical Drawing.

## Graphic Arts

V.P.I. grade prediction correlations with grades received in Graphic Arts are shown in column four of Table 4.8. The V.P.I. predicted grades in Business and in Drafting and Design correlated with grades received in Graphic Arts at above the .05 level of significance. Neither of the significant correlation areas were identified in Table 4.1 as being related to Graphic Arts. Evidence was sufficient to reject Hypothesis 2 as it relates to Graphic Arts.

## Intensive Office

V.P.I. grade prediction correlations with grades received in Intensive Office are reported in column five of Table 4.8. Hypothesis 2 was not rejected as it relates to Intensive Office with no correlations reported at the .05 confidence level.

## Data Processing

V.P.I. grade prediction correlations with grades received in Data Processing are reported in column one of Table 4.9. Grade predictions in eight of the ten V.P.I. curriculum areas were found to correlate significantly at

SKILL CENTER GRADE CORRELATIONS WITH V.P.I. GRADE PREDICTIONS

			Skill (	Center Occupationa	ıl Area	
V.P.	I. Curriculum Area	Data Process	Health Occ.	Auto Mech.	Auto Body	Truck Mech.
1.	General Academic	+0.611*	+0.378*	+0.386*	-0.030	+0.461
2.	General Vocational	+0.436*	+0.456*	+0.500*	+0.180	+0.640*
т. т	Business	+0°390*	+0.377*	+0.326*	+0.062	+0.478*
4.	Mechanics & Maint.	+0.144	+0.420*	+0.408*	+0.397	+0.731*
5.	Drafting & Design	+0.355*	+0°390*	+0.576*	+0.601*	+0.750*
6.	Metal Trades	+0.426*	+0.413*	+0.196	+0.234	+0.578*
7.	Home Ec. & Health	+0.342*	+0.378*	+0.413*	+0.262	+0.579*
в.	Construction Trades	+0.237	+0.479*	+0.295	+0.554*	+0.667*
9.	Electron. & Electric.	+0.444*	+0.353*	+0.340*	+0.335	+0.408
10.	Agr icul ture	+0.337*	+0.064	+0.275	+0.194	+0.454

\*Correlation significantly above or below zero at the .05 confidence level.

the .05 confidence level with the grade received in Data Processing.

The V.P.I. curriculum area of Business was identified in Table 4.1 as having relationships with Data Processing. Although the Business Area predicted Data Processing grades at a .05 significance level, it ranked fifth of the eight which were significant. General Academic predicted grade was the highest discriminator for Data Processing with a correlation of .611 and an r<sup>2</sup> of .37. This correlation is significanct at better than the .01 level. Hypothesis 2 was rejected as it relates to Data Processing.

## Health Occupations

V.P.I. grade prediction correlations with grades received in Health Occupations are shown in column two of Table 4.9. Grade predictions in nine of the ten V.P.I. curriculum areas were found to correlate significantly at the .05 confidence level with grades received in Health Occupations. The relationship Table 4.1 shows Home Economics and Health (7) as having relationships with Health Occupations. The measured relationship is significant. However, it ranks 6.5 in nine of ten independent variables found significant. The relative value of the Home Economics and Health grade predictions are of questionable value over the other eight predictors found significant. The

Construction Trades predicted grade was the highest discriminator for Health Occupations with a correlation of .479 and an  $r^2$  of .23. This correlation is significant at the .02 confidence level. Hypothesis 2 was rejected as it relates to Health Occupations.

### Auto Mechanics

V.P.I. grade prediction correlations with grades received in Auto Mechanics are reported in column three of Table 4.9. Grade predictions in seven of the ten V.P.I. curriculum areas were found to be significant at the .05 confidence level with grade received in Auto Mechanics.

Table 4.1 suggests a relationship between Mechanics and Maintenance (4) and Auto Mechanics. However, Mechanics and Maintenance ranks fourth in seven of ten independent variables found significant. The Drafting and Design (5) predicted grade was the highest discriminator for Auto Mechanics with a correlation of .576 which is significant at the .01 confidence level and has an  $r^2$  of .33. Hypothesis 2 as it relates to Auto Mechanics was rejected.

#### Auto Body Mechanics

V.P.I. grade prediction correlations with grades received in Auto Body Mechanics are shown in column four of Table 4.9. The V.P.I. predicted grades in Drafting and Design (5) and Construction Trades (8) correlated significantly at the .05 level with grades received in Auto Body

Mechanics. The relationships identified in Table 4.1 were not shown to be relevant with both Mechanics and Maintenance (4) and Metal Trades (6) indicating no significance at the .05 confidence level. The Drafting and Design predicted grade was the highest discriminator for Auto Body Mechanics with a correlation of .601 and an  $r^2$  of .36. Hypothesis 2 was rejected as it relates to Auto Body Mechanics.

#### Truck Mechanics

V.P.I. grade prediction correlations with grades received in Truck Mechanics are shown in column five of Table 4.9. Grade predictions in seven of the ten V.P.I. curriculum areas were found to correlate significantly at the .05 confidence level with grades received in Truck Mechanics.

Table 4.1 suggests that V.P.I. grade predictions in Maintenance and Mechanics (4) should be related to grade received in Truck Mechanics. This suggestion is supported with Maintenance and Mechanics showing a correlation of .731 significant at the .01 level of confidence. Hypothesis 2 was rejected as it relates to Truck Mechanics.

## Small Engine Mechanics

V.P.I. grade prediction correlations with grades received in Small Engine Mechanics are shown in column one of Table 4.10. Hypothesis 2 could not be rejected as it relates to Small Engine Mechanics.

			Skill	Center Occupationa	l Area	
V.P.	I. Curriculum Area	Small Engine	Aviation	Machine Occ.	Electronic Occ.	Welding
i	General Academic	+0.178	+0.444	+0.001	+0.315*	-0.829*
2.	General Vocational	+0.189	+0.328	-0.001	+0.426*	-0.694*
ъ.	Business	-0.018	+0.251	-0.197	+0.257*	-0.852*
4.	Mechanics & Maint.	+0.193	+0.306	+0.286	+0.446*	-0.591
°.	Drafting & Design	+0.240	+0.273	-0.021	+0.404*	-0.755*
6.	Metal Trades	+0.333	+0.721*	+0.418	+0.325*	-0.451
7.	Home Ec. & Health	+0.010	+0.074	-0.237	+0.294*	-0.791*
8.	Construction Trades	+0.180	+0.480*	+0.011	+0°380*	-0.489
9.	Electron. & Electric	+0.300	+0.261	+0.279	+0.425*	-0.636*
10.	Agriculture	+0.298	+0.411	+0.210	+0.335*	-0.398

SKILL CENTER GRADE CORRELATIONS WITH V.P.I. GRADE PREDICTIONS

TABLE 4.10

\*Correlation significantly above or below zero at the .05 confidence level.

91

## Aviation Mechanics

V.P.I. grade prediction correlations with grades received in Aviation Mechanics are shown in column two of Table 4.10. Metal Trades (6) and Construction Trades (8) were found to predict grades in Aviation Mechanics at the .05 level of confidence. V.P.I. curriculum areas (4) and (6) were identified in Table 4.1 as having relationships with Aviation Mechanics. This relationship is supported for Metal Trades (6) only which shows a correlation of .721 and an  $r^2$  of .54. Hypothesis 2 was rejected as it relates to Aviation Mechanics.

### Machine Occupations

V.P.I. grade prediction correlations with grades received in Machine Occupations are shown in column three of Table 4.10. Hypothesis 2 was not rejected as it relates to Machine Occupations with no significant correlations reported at the .05 confidence level.

## Electricity and Electronics Occupations

V.P.I. grade prediction correlations with grades received in Electrical and Electronics Occupations are shown in column four of Table 4.10. All ten of the V.P.I. grade predictions were found to be significant at the .05 level of confidence. Hypothesis 2 was rejected as it relates to Electrical and Electronics Occupations. Welding

V.P.I. grade prediction correlations with grades received in Welding are reported in column five of Table 4.10. Six of the ten V.P.I. grade prediction areas were found to be significant at the .05 confidence level with grades received in Welding. Metal Trades (6), identified with Welding in Table 4.1, was not found to have a significant relationship. Hypothesis 2 was rejected as it relates to Welding.

## Heating and Cooling

V.P.I. grade prediction correlations with grades received in Heating and Cooling are shown in column one of Table 4.11. Agriculture (10) predicted grades which correlated with grades received in Heating and Cooling at the .05 level of confidence. No significant relationship was noted for Mechanics and Maintenance (4) with Heating and Cooling as suggested in Table 4.1. Hypothesis 2 was rejected as it relates to Heating and Cooling.

#### House Construction

V.P.I. grade prediction correlations with grades received in House Construction are shown in column two of Table 4.11. Six of the ten V.P.I. grade prediction areas were found to correlate at the .05 confidence level with grades received in House Construction. Correlation was not significant in the Construction Trades (8) area identified

			skill c	center Occupationa	l Area	
V.P.	I. Curriculum Area	Heating & Cooling	House Construction	Floriculture	Landscaping	Cosmetology
Ŀ.	<b>General Academic</b>	+0.156	+0.289*	+0.440*	-0.337	+0.036
2.	General Vocational	+0.287	+0.333*	+0.527*	-0.153	+0.144
т.	Business	+0.244	+0.292*	+0.453*	-0.299	+0.070
4.	Mechanics & Maint.	+0.257	+0.370*	+0.462*	-0.228	+0.334
5.	Drafting & Design	+0.365	+0.220	+0.655*	-0.268	+0.285
6.	Metal Trades	+0.387	+0.110	+0.272	+0.173	+0.037
7.	Home Ec. & Health	+0.251	+0.336*	+0.540*	-0.615*	+0.209
<b>8</b>	Construction Trades	+0.327	+0.235	+0.523*	+0.134	+0.276
9.	Electron. & Electric.	-0.106	+0.360*	+0.449*	+0.358	+0.010
10.	Agriculture	+0.484*	+0.161	+0.248	-0.770*	+0.161

SKILL CENTER GRADE CORRELATIONS WITH V.P.I. PREDICTIONS

TABLE 4.11

\*Correlation significantly above or below zero at the .05 confidence level.

4

in Table 4.1 as being related to House Construction. Hypothesis 2 was rejected as it relates to House Construction.

### Floriculture

V.P.I. grade prediction correlations with grades received in Floriculture are reported in column three of Table 4.11. Eight of the ten V.P.I. grade prediction areas were found to have significance at the .05 level with grades received in Floriculture. The relationships of Agriculture (10) to Floriculture as suggested in Table 4.1 was not substantiated. Hypothesis 2 was rejected as it relates to Floriculture.

#### Landscaping Horticulture

V.P.I. grade prediction correlations with grades received in Landscaping Horticulture are reported in column four of Table 4.11. Home Economics and Health (7) and Agriculture (10) were found to have significant relationships with the grades received in Landscaping Horticulture. Agriculture was identified in Table 4.1 as having relationships with Landscaping Horticulture. However, the data shows a negative relationship which rejects the suggestion of Table 4.1. Hypothesis 2 was rejected as it relates to Landscaping Horticulture.

#### Cosmetology

V.P.I. grade prediction correlations with grades received in Cosmetology are reported in column five of Table 4.11. No correlations were found at the .05 confidence level. Hypothesis 2 could not be rejected as it relates to Cosmetology.

## Summary

<u>Hypothesis 2</u>: There is no relationship between grades predicted by the Vocational Planning Inventory (V.P.I.) and grades received in Skill Center courses-could not be rejected in the following six Skill Center Occupational Areas:

- 1. Commercial Art
- 2. Architectural Drawing
- 3. Intensive Office
- 4. Small Engine Mechanics
- 5. Machine Occupations
- 6. Cosmetology.

No significant relationships at the .05 level of confidence were found between V.P.I. predicted grades and grades received in these programs. Evidence indicates that the V.P.I. predicted grade would not be of value in the prediction of success for these programs.

Hypothesis 2 was rejected in fourteen of the Skill Center Occupational Areas. A summary of significant V.P.I.
Grade Prediction and Skill Center grade correlations is shown in Table 4.12. It appears that V.P.I. predicted grades might be of value for predicting success in the fourteen areas summarized in Table 4.12.

A total of seventy-one correlations were found to be significant. Seven of the seventy-one were identified in Table 4.1 as having relationships to the area of study. The remaining sixty-four were not identified as related in Table 4.1. Landscaping Horticulture, one of the seven having relationship was inversely related to Agriculture with an r of -0.770 and an  $r^2$  of .59.

### Hypothesis Three

<u>Hypothesis 3</u>: There is no relationship between junior high school grade point average (G.P.A.) and grades received in Skill Center courses.

Correlation coefficients were computed using grades received in each of the twenty Skill Center occupational areas and student grade point averages for the ninth grade. The correlations are presented in Table 4.13 for analysis.

Table 4.13 shows that Hypothesis 3 could not be rejected in fifteen of the twenty Skill Center occupational areas. No significant relationships at the .05 confidence level were found between junior high grade point average and grades received in these programs.

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## SUMMARY OF SIGNIFICANT V.P.I. GRADE PREDICTION AND SKILL CENTER GRADE CORRELATIONS

	Skill Center Occu <b>pa</b> tional Area	V.P	.I. Curriculum Area	н	r <sup>2</sup>	Number
н. Т	Mechanical Drawing	7.	Home Ec. & Health	+0.561	.31	13
2.	Graphic Arts	m.	Business	+0.433	.19	17
ſ		<u>،</u>  ,	Dratting & Design	+0.483	.23	
	Data Processing		General Academic General Vocational	+0.611 +0.436	.37	26
		• m	Business	+0.390	.15	
		5.	Drafting & Design	+0.355	.13	
		6.	Metal Trades	+0.426	.18	
		7.	Home Ec. & Health	+0.342	.12	
		9.	Electron. & Elect.	+0.444	.20	
		10.	Agriculture	+0.337	.11	
4.	Health Occupations	1.	General Academic	+0.378	.14	25
		2.	General Vocational	+0.456	.21	
		ъ.	Business	+0.377	.14	
		4.	Mechanics & Maint.	+0.420	.18	
		ъ.	Drafting & Design	+0.390	.15	
		6.	Metal Trades	+0.413	.17	
		7.	Home Ec. & Health	+0.378	.14	
		8.	<b>Construction Trades</b>	+0.479	.23	
		9.	Electron. & Elect.	+0.353	.12	
<u></u> .	Auto Mechanics	1.	General Academic	+0.386	.15	29
		2.	General Vocational	+0.500	.25	
		ъ.	Business	+0.326	.11	
		4.	Mechanics & Maint.	+0.408	.17	
		ۍ •	Drafting & Design	+0.576	.33	

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	Skill Center Occupational Area	V.P.	I. Curriculum Area	ы	r2	Number
5.	Auto Mechanics (continued)	7. 9.	Home Ec. & Health Electron, & Electric	+0.413 +0.340	71. 21.	
6.	Auto Body Mechanics	ۍ <u>م</u>	Drafting & Design Construction Trades	+0.601 +0.554	.36	15
7.	Truck Mechanics	~ ~	General Vocational Business	+0.640 +0.478	.41	13
		4 N	Mechanics & Maint. Drafting & Design	+0.731	• 56 • 56	
		6. 7. 8.	Metal Trades Home Ec. & Health Construction Trades	+0.578 +0.579 +0.667	.33 .33 .45	
ω	Aviation	ۍ م. ۳	Metal Trades Construction Trades	+0.721 +0.480	.52 .23	13
.6	Electronics Occ.		General Academic General Vocational Business	+0.315 +0.426 +0.257	.10 .18	76
		4 n d	Mechanics & Maint. Drafting & Design Metal Trades	+0.446 +0.404 +0.325	.20 .16	
		. 2 . 9 . 0	Home Ec. & Health Construction Trades Electron. & Electric Adriculture	+0.294 +0.380 +0.425		
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TABLE 4.12--Continued

	Skill Center Occupational Area	V.P.	I. Curriculum Area	r	r²	Number
10.	Welding	9 7 5	General Academic General Vocational Business Drafting & Design Home Ec. & Health Electron. & Electric.	-0.829 -0.694 -0.852 -0.755 -0.791	.68 .48 .72 .56 .40	ω
13. 13.	Heating & Cooling House Construction Floriculture	10. 98.2.5.4.3.2.1. 9.8.2.5.4.3.2.1.	Agriculture General Academic General Vocational Business Mechanics & Maint. Home Ec. & Health Electron. & Electric. General Vocational Business Mechanics & Maint. Drafting & Design Home Ec. & Health Construction Trades Electron. & Electric.	+0.484 +0.289 +0.289 +0.333 +0.336 +0.336 +0.360 +0.360 +0.440 +0.440 +0.453 +0.453 +0.453 +0.523 +0.523 +0.523	.23 .08 .11 .14 .28 .29 .29 .29 .29 .20 .20 .20 .20 .20 .20 .20 .20 .20 .20	18 41 16
14.	Landscaping	7. 10.	Home Ec. & Health Agriculture	-0.615 -0.770	. 38	11

TABLE 4.12--Continued

### TABLE 4.13

	Skill Center		2	<u></u>
	Occupational Area	r	r <sup>2</sup>	Number
1.	Commercial Art	+0.011	•••	14
2.	Architectural Drawing	0.136	• • •	15
3.	Mechanical Drawing	0.444	•••	13
4.	Graphic Arts	0.238	•••	17
5.	Intensive Office	0.065	• • •	21
6.	Data Processing	0.277	•••	26
7.	Health Occupations	0.314	• • •	25
8.	Auto Mechanics	0.533*	. 28	29
9.	Auto Body Mechanics	0.319	•••	15
10.	Truck Mechanics	0.217	• • •	13
11.	Small Engine Mechanics	0.351	•••	14
12.	Aviation Mechanics	0.358	•••	13
13.	Machine Occupations	0.237	•••	14
14.	Electronics Occupations	0.275*	.08	76
15.	Welding	0.723*	.52	8
16.	Heating and Cooling	0.528*	.28	18
17.	House Construction	0.330*	.11	41
18.	Floriculture	0.477	• • •	16
19.	Landscaping	0.159	• • •	11
20.	Cosmetology	0.404	• • •	28

## SKILL CENTER GRADE CORRELATIONS WITH JUNIOR HIGH GRADE POINT AVERAGE

\*Significant at the .05 confidence level.

Hypothesis 3 was rejected in five of the Skill Center occupational areas. It appears that junior high grade point average correlates significantly with grades received in Auto Mechanics, Electronics Occupations, Welding, Heating and Cooling, and House Construction.

### Hypothesis Four

<u>Hypothesis 4</u>: There is no relationship between interest and aptitude as measured by the O.V.I.S. and the V.P.I.

Correlation coefficients were computed using scale scores in each of the twenty-four O.V.I.S. classifications and predicted grades in each of the ten V.P.I. curriculum areas. Data from the total sample of 427 students was used in the computations. The correlations are reported in Table 4.14 and 4.15 for analysis.

Tables 4.14 and 4.15 contain a total of 240 correlations; 136 of the 240 are significantly correlated at the .05 confidence level. The objective of this analysis is to measure the relationships between O.V.I.S. measured interests and V.P.I. measured aptitudes as used in career planning. The objective is not met by demonstrating a significant correlation between unrelated areas (e.g., 0.743 between O.V.I.S. Medical and V.P.I. Agriculture) as this relationship is not likely to be considered by counselors.

			V.P	.I. Curriculum A1	rea	
: (	anditerification of t	General	General		Mechanics	Drafting
>	.I.S. CLASSIFICATIONS	Academic	VOCATIONAL	Business	& Maint.	& Design
٦.	Manual Work	-0.120*	-0.070	-0.102*	+0.035	-0.017
2.	Machine Work	-0.142*	-0.043	-0.168*	+0.092	+0.066
ч.	<b>Personal Services</b>	+0.078	+0.077	+0.114*	+0.080	+0.051
4.	Caring for People	+0.186*	+0.125*	+0.200*	+0.050	+0.046
<u>ъ</u>	Clerical Work	+0.247*	+0.211*	+0.259*	+0.160*	+0.155*
ف	Inspecting, Testing	-0.018	+0.056	-0.014	+0.166*	+0.135*
7.	Crafts and Precise	-0.127*	-0.004	-0.150*	+0.131*	+0.125*
ω	Customer Services	+0.186*	+0.175*	+0.196*	+0.138*	+0.136*
<u>б</u>	Nursing, Rel. Tech.	+0.196*	+0.139*	+0.208*	+0.048	+0.074
10.	Skilled Personal	+0.167*	+0.135*	+0.192*	+0.092	+0.065
11.	Training	+0.095	+0.148*	+0.072	+0.168*	+0.173*
12.	Literary	+0.171*	+0.167*	+0.179*	+0.108*	+0.118*
13.	Numerical	+0.153*	+0.184*	+0.125*	+0.152*	+0.199*
14.	Appraisal	+0.033	+0.122*	-0.015	+0.179*	+0.212*
15.	Agriculture	-0.070	+0.023	-0.078	+0.125*	+0.113*
16.	Applied Technology	-0.011	+0.076	-0.063	+0.127*	+0.167*
17.	Promotion, Commun.	+0.186*	+0.180*	+0.163*	+0.135*	+0.157*
18.	Management	+0.101*	+0.138*	+0.072	+0.143*	+0.184*
19.	Artistic	+0.153*	+0.154*	+0.137*	+0.125*	+0.116*
20.	Sales Representative	+0.094	+0.156*	+0.077	+0.194*	+0.214*
21.	Music	+0.034	+0.171*	+0.048	+0.005	-0.017
22.	Entertainment	+0.125*	+0.091	+0.142*	+0.016	+0.025
23.	Teaching, Soc. Work	+0.198*	+0.162*	+0.190*	+0.067	+0.101*
24.	Medical	+0.127*	+0°100*	+0.122*	+0.050	+0.083

O.V.I.S. SCALE SCORES CORRELATIONS WITH V.P.I. CURRICULUM AREAS

TABLE 4.14

\*Correlation significantly above or below zero at the .05 confidence level.

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			ν.	P.I. Curriculum Ar	eas	
0.V.	.I.S. Classifications	Metal Trades	Home Ec. & Health	Construction Trades	Electron. & Electric.	Agriculture
	Manual Work	-0.054	-0.095	+0.010	+0.030	-0.104*
5.	Machine Work	+0.048	-0.117*	+0.058	+0.122*	+0.012
Э.	Personal Services	+0.027	+0.077	+0.081	+0.030	-0.060
4.	Caring for People	+0.068	+0.132*	+0.070	-0.028	-0.034
5.	Clerical Work	+0.125*	+0.236*	+0.143*	+0.093	+0.067
<b>و</b> .	Inspecting, Testing	+0.074	+0.023	+0.122*	+0.112*	+0.021
7.	Crafts and Precise	+0.104*	+0.096	+0.102*	+0.157*	+0.036
8.	Customer Services	+0.124*	+0.169*	+0.146*	+0.125*	+0.021
.6	Nursing, Rel. Tech.	+0.064	+0.176*	+0.052	-0.023	+0.066
10.	Skilled Personal	+0.034	+0.162*	+0.078	0.000	+0.003
11.	Training	+0.135*	+0.086	+0.157*	+0"195*	+0.037
12.	Literary	+0.097	+0.157*	+0.095	+0.104*	+0.037
13.	Numerical	+0.146*	+0.152*	+0.130*	+0.195*	+0.120*
14.	Appraisal	+0.159*	+0.052	+0.129*	+0.235*	+0.132*
15.	Agriculture	+0.083	-0.056	+0.126*	<b>*</b> 660°0+	-0.030
16.	Applied Technology	+0.139*	-0.002	+0.091	+0.213*	+0.106*
17.	Promotion, Commun.	+0.135*	+0.164*	+0.114*	+0.152*	+0.092
18.	Management	+0.141*	+0.107*	+0.108*	+0.171*	+0.111*
19.	Artistic	+0.089	+0.145*	+0.098*	+0.137*	+0.050
20.	Sales Representative	+0.168*	+0.119*	+0.156*	+0.204*	+0.137*
21.	Music	+0.014	+0.046	+0.022	-0.020	-0.013
22.	Entertainment	+0.007	+0.112	+0.014	+0.022	-0.010
23.	Teaching, Soc. Work	+0.100*	+0.149*	+0.080	+0.050	+0.242*
24.	Medical	+0.068	+0.121*	+0.043	+0.028	+0.743*

O.V.I.S. SCALE SCORES CORRELATIONS WITH V.P.I. CURRICULUM AREAS

TABLE 4.15

\*Correlation significantly above or below zero at the .05 confidence level.

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The relationships between O.V.I.S. and V.P.I. as they are perceived to exist and as they are used are identified in Table 4.1. Analysis will be based on the relationships identified in Table 4.1. V.P.I. General Academic and General Vocational predictions are not linked to specific interest areas so they are not included with the eight specific V.P.I. curriculum areas for analysis.

O.V.I.S. Classification and V.P.I. Curriculum Area relationships are summarized in Table 4.16 with correlations. When the correlations are organized in this manner it is noted that 25 of 39 are significantly correlated at the .05 confidence level. A relationship does exist then between O.V.I.S. measured interest and V.P.I. measured aptitude. Hypothesis 4 was rejected. The coefficients of determination  $(r^2)$  were quite low, the highest--.06--indicates that only 6 percent of the variance of the V.P.I. predicted grade can be attributable to the variability of O.V.I.S. scale scores.

### Hypothesis Five

<u>Hypothesis 5</u>: A combination of O.V.I.S. measured interest, V.P.I. measured aptitude, and previous grade point average will not predict grades in Skill Center courses at a higher level of significance than any of these indicators taken singly.

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TABLE	

O.V.I.S. CLASSIFICATION AND V.P.I. CURRICULUM AREA RELATIONSHIPS

	V.P.I. Curriculum Area	0 <b>.V</b> .	I.S. Classification	ч	r <sup>2</sup> *
т	Business	2.	Machine Work	-0.168	
		ۍ •	Clerical Work	+0.259	.06
		7.	<b>Crafts and Precise</b>	-0.150	
		8.	Customer Services	+0.196	.04
		13.	Numerical	+0.125	.02
		17.	Promotion, Commun.	+0.163	.03
		18.	Management	+0.072	
4.	Mechanics & Maint.	г.	Manual Work	+0.035	
		2.	Machine Work	+0.092	
		6.	Inspecting, Testing	+0.166	.03
		7.	<b>Crafts and Precise</b>	+0.131	.02
		14.	Appraisal	+0.179	.03
		18.	Management	+0.143	.02
ۍ ۳	Drafting & Design	7.	<b>Crafts and Precise</b>	+0.125	.02
		13.	Numerical	+0.199	.04
		14.	Appraisal	+0.212	.04
		16.	Applied Technology	+0.167	.03
		19.	Artistic	+0.116	.01

 $\star r^2$  is reported if r is positive and significant.

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TABLE 4	

	V.P.I. Curriculum Area	0.V.I	.S. Classification	н	r²*
•	Metal Trades	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Manual Work Machine Work Crafts and Precise Appraisal Management	-0.054 +0.048 +0.104 +0.159 +0.141	.01 .03
7.	Home Ec. & Health	3. ] 4. 6 7. 6 9. ] 10. 8 18. 1	Personal Services Caring for People Crafts and Precise Nursing, Rel. Tech. Skilled Personal Management	+0.077 +0.132 +0.096 +0.176 +0.162 +0.107	.02 .03 .03
°.	Customer Services Electron. & Electric.	1. 1 7. 0 14. 1 1. 1 1. 1 18. 1	Manual Work Crafts and Precise Appraisal Manual Work Crafts and Precise Management	+0.010 +0.102 +0.129 +0.030 +0.157 +0.171	.01 .02 .02
10.	Agriculture	1. 1 15. 1 19. 20.	Manual Work Agriculture Artistic Sales Representative	-0.104 -0.030 +0.050 +0.137	.02

 $\star r^2$  is reported if r is positive and significant.

Perceived relationships were not used in the testing of this hypothesis. The logic of the computer was first utilized to select from the data those variables of greatest value to prediction in a regression equation. The computer using least squares regression selected one or two of the most important O.V.I.S. and one or two of the most important V.P.I. correlations for each Skill Center occupational area.

The selected independent variables were combined with junior high grade point average and their respective beta weights in the regression equation. Coefficients of multiple regression (correlation) with grades received in each Skill Center occupational area were computed. These correlations are reported in Table 4.17.

The highest correlations obtained with single independent variables in each of the Skill Center occupational programs are compared with regression correlations in Table 4.18.

It can be seen from Table 4.18 that correlations were significant in Skill Center occupational areas in eight of twenty cases for O.V.I.S., in fourteen of twenty cases for V.P.I., in five of twenty cases for G.P.A., and in 16 of twenty cases with those three independent variables combined in multiple regression. Table 4.18 shows that the correlations (r) and the coefficients of determination  $(r^2)$ are consistently higher when the variables are combined. Hypothesis 5 was rejected.

TABLE	4.	1	7
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	Skill Center Occupational Area	Variables	Beta Wts	r	r <sup>2</sup> *	N
1	Commercial Art	CDA	+0 027	+0 034	97	14
1.	commercial Alt	OVIS 21	-0.513	TU.934	•07	14
		OVIS 18	-0.013			
		VDT 6	+0.469			
		VPT 5	-0 158			
2	Architectural	GPA	-0.146	+0.741	. 55	15
2.	Drawing		+1.000		• 55	15
	220,1113	OVIS 22	-0.702			
		VPI 3	+0.230			
3.	Mechanical	GPA	-0.072	+0.913	.83	13
	Drawing	OVIS 11	+0.824			
		OVIS 10	-0.858			
		VPI 7	+0.655			
		VPI 6	-0.213			
4.	Graphic Arts	GPA	-0.076	+0.742	NS	17
	-	OVIS 19	+0.387			
		OVIS 16	-0.209			
		VPI 5	+1.195			
		VPI 4	-0.729			
5.	Intensive Office	GPA	-0.087	+0.562	NS	21
		OVIS 5	-0.253			
		OVIS 17	-0.067			
		<b>VPI 10</b>	+0.577			
6.	Data Processing	GPA	+0.039	+0.704	.50	26
		OVIS 21	-0.607			
		O <b>VIS 20</b>	+0.483			
		VPI 9	+0.434			
7.	Health	GPA	+0.309	+0.743	.54	25
	Occupations	OVIS 19	-0.929			
		OVIS 23	+0.792			
_		VPI 8	+0.211			
8.	Auto Mechanics	GPA	+0.273	+0.732	. 54	29
		OVIS 15	+0.255			
		OVIS 14	+0.184			
		VPI 5	+0.597			
		VPI 6	-0.370			

REGRESSION CORRELATIONS FROM COMBINED VARIABLES

\*Reported NS if Not Significant.

	Skill Center	Variables	Beta Wts	r	r <sup>2</sup> *	N
		Variabies		±		
9.	Auto Body	GPA	+0.100	+0.841	. 71	15
2.	Mechanics	OVIS 1	-0.781		• • •	10
		OVIS 8	+0.493			
		VPI 5	+0.429			
		VPI 6	-0.257			
10.	Truck Mechanics	GPA	-0.010	+0.812	.65	13
		OVIS 16	+0.310			
		OVIS 9	-0.461			
		VPI 5	+0.723			
11.	Small Engine	GPA	+0.230	+0.713	NS	14
	Mechanics	OVIS 4	-0.709			
		OVIS 11	+0.463			
		VPI 4	+0.177			
12.	Aviation	GPA	+0.127	+0.833	NS	13
	Mechanics	OVIS 14	+1.099			
		OVIS 1	-0.865			
		VPI 6	+0.712			
		VPI 8	-0.548			
13.	Machine	GPA	-0.085	+0.920	.85	14
	Occupations	OVIS 19	-1.482			
		OVIS 9	+0.914			
		VPI 6	+0.155			
		VPI 3	+0.056			
14.	Electronics	GPA	+0.171	+0.422	.18	76
	Occupations	OVIS 13	+0.303			
		OVIS 5	-0.236			
		VPI 9	+0.237			
15.	Welding	GPA	+0.422	+0.996	.99	8
		OVIS 22	+0.513			
		OVIS 13	-0.159			
		VPI 3	-1,247			
		VPI 7	+0.955			
16.	Heating and	GPA	+0.247	+0.811	.66	18
	Cooling	OVIS 21	-0.273			
		OVIS 19	+0.255			
-		<u>VPI 10</u>	+0.508			
17.	House	GPA	+0.153	+0.586	.34	41
	Construction	OVIS 4	-0.479			
		OVIS 3	+0.326			
		VPI 4	+0.589			
		<b>V</b> PI 10	-0.287			

TABLE 4.17--Continued

\*Reported NS if Not Significant.

	Skill Center Occupational Area	Variables	Beta Wts	r	r <sup>2</sup> *	N
18.	Floriculture	GPA OVIS 21 OVIS 9 VPI 5 VPI 6	+0.239 -0.426 -0.071 +1.006	+0.886	.79	16
19.	Landscaping	GPA OVIS 2 OVIS 21 VPI 7 VPI 10	+0.456 +0.872 -0.440 -0.195 -0.118	+0.892	.80	11
20.	Cosmetology	GPA OVIS 14 OVIS 16 VPI 4 VPI 9	+0.384 +0.467 -0.209 +0.397 -0.306	+0.676	.46	28

TABLE 4.17--Continued

\*Reported NS if Not Significant.

### Summary

Five hypotheses were tested in this chapter to explore the relative value of selected variables in predicting success in area vocational programs and in the career planning process.

Hypothesis 1 was tested by computing correlation coefficients using grades received in each of the twenty Skill Center occupational areas and scale scores in each of the twenty-four O.V.I.S. classifications. Hypothesis 1 could not be rejected for twelve and was rejected for eight of the Skill Center occupational areas.

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# HIGHEST CORRELATIONS--SINGLE VARIABLES AND COMBINED VARIABLES, BY SKILL CENTER OCCUPATIONAL AREA

Skill Center Occupational Area	NUIS r	$v_{r}^{2*}$	VPI r	VPI r <sup>2</sup> *	GPA r	GPA r <sup>2</sup> *	Multiple r	Multiple r <sup>2</sup> *	z
Commercial Art	+0.687	.47	+0.423	NS	+0.011	NS	+0.934	.87	14
Architectural Draw.	+0.457	SN	-0.225	NS	+0.136	SN	+0.741	.55	15
Mechanical Draw.	+0.394	NS	+0.561	.31	+0.444	NS	+0.913	.83	13
Graphic Arts	-0.381	NS	+0.483	. 23	+0.238	NS	+0.742	NS	17
Intensive Office	-0.188	NS	+0.317	NS	+0.065	NS	+0.562	NS	21
Data Processing	-0.323	SN	+0.611	.37	+0.277	SN	+0.704	.50	26
Health Occ.	+0.362	SN	+0.479	.23	+0.314	NS	+0.743	. 54	25
Auto Mechanics	+0.406	.16	+0.576	. 33	+0.533	. 28	+0.732	.54	29
Auto Body Repair	+0.546	.30	+0.601	.36	+0.319	NS	+0.841	.71	15
Truck Mechanics	+0.508	NS	+0.750	• 56	+0.217	NS	+0.812	.65	13
Small Engine Mech.	-0.437	SN	+0.333	NS	+0.351	NS	+0.713	NS	14
Aviation Mech.	+0.507	NS	+0.721	.52	+0.358	SN	+0.833	NS	13
Machine Occ.	-0.721	.51	+0.418	SN	+0.237	NS	+0.920	.85	14
Electronics Occ.	+0.195	NS	+0.446	. 20	+0.275	.08	+0.422	.18	76
Welding	+0.874	.76	-0.852	.72	+0.723	.52	+0.996	.99	80
anitool a anitool		5		ç	0 1 0 -	QC		U	0
House Construction	+0.201	SN	+0,370	14	+0.330		+0.586	34	2  <del>4</del>
Floriculture	-0.637	.41	+0.655	.43	+0.477	NS	+0.886	10.	16
Landscaping	+0.582	NS	-0.770	.59	+0.159	NS	+0.892	.80	11
Cosmetology	+0.402	.16	+0.334	NS	+0.404	NS	+0.676	.46	28

 $<sup>*</sup>r^2$  shown as NS if r not significant at .05 level.

Hypothesis 2 was tested by computing correlation coefficients using grades received in each of the twenty Skill Center occupational areas and predicted grades in each of the ten V.P.I. curriculum areas. Hypothesis 2 was not rejected for six and was rejected for fourteen of the Skill Center occupational areas.

Hypothesis 3 was tested by computing correlation coefficients using grades received in each of the twenty Skill Center occupational areas and student grade point averages for the ninth grade. Hypothesis 3 could not be rejected in fifteen and was rejected in five of the Skill Center occupational areas.

Hypothesis 4 was tested by computing correlation coefficients using scale scores in each of the twenty-four O.V.I.S. classifications and predicted grades in each of the ten V.P.I. curriculum areas. Hypothesis 4 was rejected.

Hypothesis 5 was tested by using selected independent variables in least square multiple regression. The resultant coefficients of multiple regression were compared with the correlations of the separate independent variables and grades received in Skill Center occupational areas. Hypothesis 5 was rejected.

### CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### Introduction

This chapter is presented in three sections: a general summary of the study, conclusions reached with supporting discussion, and recommendations with implications for future research. All references to significance in this chapter are in terms of the .05 level of significance.

### Summary

The purpose of this study was to improve the process of selecting students for participation in secondary area vocational programs through the identification of predictive variables.

The need for the study was emphasized by pointing out the increasing pressures on public education to play a viable role in manpower development. Occupational preparation options are increasing on the secondary level without students having career plans or an adequate background for decision making.

It was theorized that decision making can and should take place at an early age and that measured interests,

measured aptitudes and previous grade point averages are of value for career decision making.

Five hypotheses were developed to examine the relative value of Ohio Vocational Interest Survey (O.V.I.S.) measured interest, Vocational Planning Inventory (V.P.I.) measured aptitude and previous grade point average in the prediction of success in area vocational programs.

The literature was reviewed relative to the use of measured interest, measured aptitude and previous grade point average in career planning. In the review a trend toward increased use of testing at the secondary level was shown. There seemed to be agreement that measured interests, measured aptitudes, and achievement are basic psychological components of the guidance and counseling process. The lack of a process model dealing with the application of testing data was supported. No studies were found that attempted to improve the process of selecting students for participation in secondary area vocational programs through the identification of predictor variables. The need for the study was supported.

A sample of 427 juniors geographically representing Genesee County and now attending the Skill Center was identified. The following five hypotheses were stated in null form for testing:

<u>Hypothesis 1</u>: There is no relationship between interests measured with the Ohio Vocational Interest

Survey (O.V.I.S.) and grades received in Skill Center courses.

<u>Hypothesis 2</u>: There is no relationship between grades predicted by the Vocational Planning Inventory (V.P.I.) and grades received in Skill Center courses.

<u>Hypothesis 3</u>: There is no relationship between junior high school grade point average (G.P.A.) and grades received in Skill Center courses.

<u>Hypothesis 4</u>: There is no relationship between measured interest and measured aptitude as measured by the O.V.I.S. and the V.P.I.

<u>Hypothesis 5</u>: A combination of O.V.I.S. measured interest, V.P.I. measured aptitude, and previous grade point average will not predict grades in Skill Center courses at a higher level of significance than any of these indicators taken singly.

The Pearson Product-Moment method was used to compute coefficients of correlation necessary for testing hypotheses one through four. Least Squares multiple regression was used to compute the multiple regression coefficients necessary for testing hypothesis five.

### Conclusions

Based upon the results of this study the following conclusions were reached:

 The interpretation of test results as specified in the tests under consideration in counseling

could be worse than having no test data at all. The measurement of relationships between the variables of this study were not consistent with the pre-determined relationships identified by counselors and test makers. Only one of the twenty correlations found significant when testing hypothesis one was consistent with the relationships identified.

The name of the scale scores were not shown to be indicative of their measured relationships. The O.V.I.S. scale score Entertainment in Skill Center Occupational Area Welding, for example, had a correlation of .874 and a coefficient of determination of .76.

The unpredicted relationships were apparent with V.P.I. predictions, too. Only seven of seventy-one correlations were found consistent with pre-determined relationships. The measured value of a predictor compared with the reported value can be questioned from the data. The V.P.I. predicted grade in Agriculture, for example, had -0.770 correlation with the Skill Center Landscaping Occupational Area. Counselors and test makers reported Agriculture and Landscaping as being positively related.

 Selected O.V.I.S. scale scores are of value in the prediction of success in some occupational areas.

Hypothesis one was rejected for eight of the twenty Skill Center occupational areas. Twenty of a possible 480 correlations were found significant. These data, although sufficient to reject the hypothesis, are not too impressive as support for the predictive value of O.V.I.S. Ten of the twenty significant correlations were found in Commercial Art. On page 34 in the review of literature in this study, the point was made that high intercorrelations as in the Commercial Art example offer no sound basis for differential prediction and reduce the value of the tests. As was pointed out in the discussion with conclusion one, only one correlation was found consistent with predetermined values. The value of the 0.V.I.S. as indicated in this study would require the identification of new relationships.

3. Selected V.P.I. grade predictions are of value

in the prediction of success in some occupational areas.

Hypothesis two was rejected for fourteen of the Skill Center occupational areas. Seventy-one of a possible 200 correlations were found. The data of this study would not support the use of V.P.I. measures in the specific way some authors describe their use of aptitude tests on page 33 in the review of literature.

Relatively high intercorrelations were apparent in the V.P.I.: in the Electricity and Electronics Skill Center Occupational Area, all ten V.P.I. curriculum areas were significantly correlated. In eight of the fourteen Skill Center occupational areas, six or more of the ten V.P.I. curriculum areas were found to have significant correlations. As noted in conclusion two, predictive value is reduced as intercorrelations increase. Although V.P.I. grade predictions were found to have value, that value was not consistent with predetermined relationships.

> Junior high school grade point averages are of value in the prediction of success in some occupational areas.

Achievement as measured by G.P.A. was shown to have less value in prediction than either O.V.I.S. measured interest or V.P.I. measured aptitude. Although G.P.A. was found to be of some value in prediction, support is shown for Tyler's statement on page 35 of this study that ". . . a more efficient selection could be made by using a battery of tests than by depending upon the previous educational record of the student." Only five of the twenty Skill Center occupational areas indicated correlations with occupational grade received and junior high G.P.A. Hypothesis three was rejected for those five.

5. There is some relationship between O.V.I.S.

measured interest and V.P.I. measured aptitude. Relationships were evaluated between O.V.I.S. measured interest and V.P.I. measured aptitudes in the testing of hypothesis four. Twenty-five of a possible thirty-nine significant correlations were found in related areas of the two tests, resulting in the rejection of the null hypothesis.

The review of literature did not produce much evidence showing close relationships between interests and aptitude. The point brought out on page 31 was supported; the relationship is too low for one to substitute for the other and both measures are needed for evaluation. The relationships found were higher than expected, however, the  $r^2$  was quite low. The highest  $r^2$  was .06 meaning that only 6 percent of the variance of one test is associated with the variability of the other.

> 6. Predictive variables when used in combination in a multiple regression equation are of more predictive value than any of the variables taken singly.

Hypothesis five was rejected. A combination of variables in multiple regression produced significant correlations with more occupational areas than with any variable taken alone. Both the correlations and coefficients of determination were consistently higher when the variables were combined.

7. The multiplicity of input and the weighting of test data in the career planning process can best be handled and interpreted by a computer as opposed to the more personal handling and interpretation by counselors.

The data of this study indicated that the values applied to test data by counselors was dysfunctional. The computer is suited for handling the myriad of mathematical weighting and computing necessary for the interpretation of data. Counselors have neither the skill nor the time. Counselors are subjective and biased--and tests need objective interpretation. On page 35 Thorndike is guoted as saying:

The variation from teacher to teacher and place to place bears witness to the fact that no fundamental anchor or reference point exists for grades.

It seems that it could also be said that--the variation from counselor to counselor and place to place bears witness to the fact that no fundamental anchor or reference point exists for the interpretation of tests.

> There is still a need for a career planning process model objectively utilizing psychological information.

### Recommendations

It is recommended that an experimental systematized process model be developed and implemented on a trial basis. In this model the handling and interpretation of social facts should be assigned to counselors and the handling and interpretation of psychological facts should be assigned to objective and accountable computer programs.

It was established in Chapter I that career plans are needed for decision making and that so-called "vocational students" are not being served. The present approach to career planning is not working.

Reported on page 9 of this study is Gilbert's conclusion that ". . . direct personal relationships of client and counselor was not of great importance in client acceptance of counseling." Super supported objective evaluation over subjective evaluations when he made the statement quoted on page 37 of this study. It is hoped that students could accept conclusions, alternatives, and recommendations from a computer program as well as from a counselor.

A trend toward increased testing was identified in the review of literature. Marland was quoted on page 26 as recommending to the College Entrance Examination Board that they assume the responsibility for the development of a comprehensive testing institution ". . . which would establish a valid measure of competence for job entry." The need for an objective method of handling and interpreting test data is increasing.

The investment in test materials and processing is far too great to trust to casual interpretations by counselors working in less than the best conditions; and interpretations must be casual when counselors must work with ratios of 400 to one. Counselors could not assimilate the detail associated with over 20,000 different jobs listed in the *Dictionary of Occupational Titles*. Counselors lack the skills and time to combine various test results in regression equations, an approach shown to be superior in this study.

It would be possible for a computer program to allow the inputs from a very large assortment of psychological facts about an individual, match these inputs against established criteria and produce a variety of career plans. Students then, with the assistance of their counselor, could select or deviate from those plans based on social facts brought out by the counselor.

Carried to the extreme it might be possible to program social facts as well as psychological facts. If this were to happen the counselor would then be charged with sorting out the pertinent individual facts to be weighted and processed with established criteria in the computer. There will always be a job for the counselor, however, his duties can and should change.

Kuder as reported on page 30 suggested that interest inventories be compared by determining the extent to which they lead to similar results in the counseling process. The proposed systematized approach to counseling could be evaluated in the same way, pending evaluations based on the successful implementation of students career plans.

It has been said that the solution should be as drastic as the crisis or problem. Most students do not have career plans and public education, as presently operated, cannot assist them in their development. It is proposed that as much as possible of the counseling process be delegated to computer programs as soon as possible--perhaps the computer assisted guidance program of the Genesee Intermediate School District has a good start.

### SELECTED BIBLIOGRAPHY

### SELECTED BIBLIOGRAPHY

- Area Manpower Review. Michigan Employment Security Commission, April, 1971.
- Barclay, James R. Controversial Issues in Testing. Series III: Testing, Guidance Monograph Series. Boston: Houghton Mifflin Company, 1969.
- Barry, Ruth, and Beverly Wolf. Epitaph for Vocational Guidance. New York: Bureau of Publications, Teachers College, Columbia University, 1962.

- 11

- Bauernfeind, Robert H. School Testing Programs. Series III: Testing, Guidance Monograph Series. Boston: Houghton Mifflin Company, 1968.
- Borow, Henry. Man in a World at Work. Boston: Houghton Mifflin Company, 1964.
- Buehler, Charlotte. Der Menschlicke Lebenslauf als Psychologisches Problem. Leipzig: Hirzel, 1933. Cited by Donald E. Super. Psychology of Careers. New York: Harper and Brothers, 1957.
- Career Education Program Model. Michigan Department of Education, Vocational Education and Career Development Service, 1971.
- Carp, A. "Evaluating Personal Potentials." Computer-Based Vocational Guidance Systems. U.S. Department of Health, Education and Welfare: Office of Education. Washington, D.C.: Government Printing Office, 1969, pp. 46-58.
- Cole, Nancy S., and Gary R. Hanson. "An Analysis of the Structure of Vocational Interests." Journal of Counseling Psychology, XVIII (September, 1971), 478-86.
- Croft Federal Aid Service. 100 Garfield Avenue, New London, Connecticut, VI (April 9, 1971).
- Economic Report of the President. Annual Report of the Council of Economic Advisors. Washington, D.C.: Government Printing Office, January, 1962.

- Feingold and Swerdloff. Occupations and Careers. St. Louis, Mo.: Webster Division, McGraw-Hill Book Company, 1969.
- Feldman, Marvin J. "Zeroing in on a Program of Zero Rejects." Condensed from School Shop, XXIX (April, 1970), 86-90.
- Fine, Sidney A. "The Systems Approach: An Emerging Behavioral Model for Vocational Guidance--A Summary Report." Research and Development Series, No. 45. The Center for Vocational and Technical Education, Ohio State University, November, 1969, pp. 1-37.
- Fisher and Yates. Statistical Tables for Biological Agricultural, and Medical Research. 6th ed. New York: Hafner Publishing Company, 1967.
- Friedenberg, Edgar Z. "Can Testing Contribute to the Quest for Community Among Students?" Report of the Commission on Tests, II. Briefs. New York: College Entrance Examination Board, 1970, pp. 33-36.
- Froehlich, C. P., and J. G. Darley. Studying Students. Chicago: Science Research Associates, 1952.
- Garrett, Henry E. Statistics in Psychology and Education. New York: Longmans, Green and Company, 1961.
- Gilbert, William M., and Thomas N. Ewing. "Programmed Versus Face to Face Counseling." Journal of Counseling Psychology, XVIII (1971), 413-21.
- Ginzberg, Eli. "Toward a Theory of Occupational Choice." Occupations, XXX (1951), 491-94.
- Havighurst, Robert J. Human Development and Education. New York: Longmans, Green Company, 1953.
- Holland, John L., and Robert C. Nichols. "A Longitudinal Study of Change in Major Field of Study." Personnel and Guidance Journal, XLIII (1964), 235-42.
- Hollender, John W. "Development of Vocational Decisions During Adolescence." Journal of Counseling Psychology, XVIII (May, 1971), 244-48.
- Johnson, Richard W. "Are S.V.I.B. Interests Correlated with Differential Academic Achievement?" Journal of Applied Psychology, XLIX, No. 4 (1965), 302-09.

- Katz, Martin R. "Expanding the Student's Decision Making Power." Bulletin of the National Association of Secondary Principals, No. 346, May, 1970, pp. 88-95.
- Kaufman, Jacob J., and others. The Role of the Secondary Schools in the Preparation of Youth for Employment.
  Institute for Research on Human Resources. University
  Park: Pennsylvania State University, February, 1967.
- Kuder, Frederic. "A Note on the Comparability of Occupational Scores from Different Interest Inventories." Measurement and Evaluation in Guidance. American Personnel and Guidance Association, II, No. 2 (Summer, 1969), 94-100.
- Linden, James D. Tests on Trial. Series III: Testing, Guidance Monograph Series. Boston: Houghton Mifflin Company, 1969.
- Lyman, Howard B. Intelligence, Aptitude, and Achievement Testing. Series III: Testing, Guidance Monograph Series. Boston: Houghton Mifflin Company, 1968.
- Marland, Sidney P., Jr. "A Proposal for a Comprehensive System of Testing for Job Entry." Report of the Commission on Tests, II. Briefs. New York: College Entrance Examination Board, 1970, pp. 68-82.
- Marland, Sidney P., Jr. "Career Education Now." Bulletin of the National Association of Secondary Principals, No. 355. Department of Health, Education and Welfare. Washington, D.C.: Government Printing Office, May, 1971, pp. 1-11.
- Miller, D. C., and W. H. Form. Industrial Sociology. New York: Harper and Row, 1951.
- Ohio Vocational Interest Survey (Information Brochure). New York: Harcourt Brace Jovanovich, Inc., 1970.
- Ohio Vocational Interest Survey (Interest Inventory). New York: Harcourt Brace Jovanovich, Inc., 1970.
- Ohio Vocational Interest Survey: Manual for Interpreting. New York: Harcourt Brace Jovanovich, Inc., 1970.
- Ohio Vocational Interest Survey: Student Report Folder. New York: Harcourt, Brace and World, Inc., 1969.

- A Position Statement Concerning the Development of Area Vocational and Technical Education Programs in Michigan. Michigan Department of Education, Lansing, Michigan, July, 1967.
- Rhodes, James A. Alternative to a Decadent Society. Indianapolis, Ind.: Howard W. Sams and Company, Inc., 1969.
- Ross, C. C. Measurement in Today's Schools. 2nd ed. New York: Prentice Hall, Inc., 1947.
- School District Statistical Information. Board of Education, Genesee Intermediate School District, Flint, Michigan, 1971.
- School District Summaries and Information: 1970-71. Published by Board of Education, Genesee Intermediate School District, Flint, Michigan.
- Sharf, Richard. "Relative Importance of Interest and Ability in Vocational Decision Making." Journal of Counseling Psychology, XVII (May, 1970), 258-62.
- Stodola, Quentin, and Kalmer Stordahl. Basic Educational Tests and Measurement. Chicago: Science Research Associates, Inc., 1967.
- Strong, E. K., Jr. Vocational Interests of Men and Women. Palo Alto: Stanford University Press, 1943.
- Super, Donald E. Appraising Vocational Fitness. New York: Harper and Brothers, 1949.
- Super, Donald E. "Basic Function of Guidance and Counseling: Planning Personal Career Development." Computer-Based Vocational Guidance System. U.S. Department of Health, Education and Welfare: Office of Education. Washington, D.C.: Government Printing Office, 1969.
- Super, Donald E. Psychology of Careers. New York: Harper and Brothers, 1957.
- Taylor, Ronald G., and Gary R. Hanson. "Interest and Persistence." Journal of Counseling Psychology, XVII, No. 6 (1970), 506-509.
- A Tentative Plan for the Development of Area Vocational Education Centers in Michigan. Michigan Department of Education, 1970.

- Thorndike, Robert L., and Elizabeth Hagen. Measurement and Evaluation in Psychology and Education. New York: John Wiley and Sons, Inc., 1961.
- Today's Students Prepare for Tomorrow. Genesee Area Skill Center, G-5081 Torrey Road, Flint, Michigan, 48507.
- Tyler, Ralph W. "The Road to Better Appraisal." Journal of the National Education Association, XXXVIII (May, 1948), 336.
- Venn, Grant. Man, Education, and Manpower. Washington, D.C.: The American Association of School Administrators, 1970.
- Vocational Planning Inventory: Your V.P.I. Report and What It Means. Chicago: Science Research Associates, Inc., 1968.
- Warters, Jane. Techniques of Counseling. New York: McGraw-Hill Book Company, Inc., 1954.
