

AN EMPIRICAL VALIDATION OF VOCATIONAL AND  
TECHNICAL EDUCATION GRADUATES'  
INITIAL EMPLOYMENT PATTERNS

By

LONNIE A. HOLMES

Bachelor of Science  
Oklahoma State University  
Stillwater, Oklahoma  
1950

Master of Business Administration  
University of Tulsa  
Tulsa, Oklahoma  
1961

Submitted to the Faculty of the Graduate College  
of the Oklahoma State University  
in partial fulfillment of the requirements  
for the Degree of  
DOCTOR OF EDUCATION  
May, 1971

OKLAHOMA  
STATE UNIVERSITY  
LIBRARY  
AUG 11 1971

AN EMPIRICAL VALIDATION OF VOCATIONAL AND  
TECHNICAL EDUCATION GRADUATES'  
INITIAL EMPLOYMENT PATTERNS

Thesis Approved:

*Paul V. Brader*

Thesis Adviser

*E. J. Ferguson*

*William H. Rambo*

*Robert P. Alicatore*

*D. D. Durham*

Dean of the Graduate College

788329

## PREFACE

Trained manpower must be available if industrial and economic expansion is to take place. Research efforts are necessary to investigate procedures for relating skilled manpower requirements to the output of training institutions.

This study is an attempt to empirically test a procedure for matching the initial employment patterns of Oklahoma vocational and technical education graduates against manpower requirements.

The author wishes to express appreciation for the encouragement and assistance given by Dr. Paul V. Braden, Chairman, and Drs. Robert T. Alciatore, Earl J. Ferguson, and William W. Rambo, doctoral committee members. The cooperation of Mr. Krishan K. Paul and other members of the Occupational Training Information System staff were most valuable in completing this study.

A special thank you is extended to Velda Davis for her excellent typing and general assistance in the preparation of this dissertation.

Finally, I would like to express my sincerest gratitude to my wife, Frances, and children, Peggy, George, and John, for their sacrifice, patience, and understanding.

## TABLE OF CONTENTS

| Chapter  | Page |
|--|------|
| I. THE PROBLEM . . . . .                               | 1    |
| The Purpose . . . . .                                  | 2    |
| Need for Study . . . . .                               | 2    |
| Research Questions . . . . .                           | 4    |
| Limitations of the Study . . . . .                     | 4    |
| Definition of Terms . . . . .                          | 5    |
| II. REVIEW OF LITERATURE . . . . .                     | 7    |
| Historical Development . . . . .                       | 7    |
| Present Conditions . . . . .                           | 11   |
| Future Trend and Developments . . . . .                | 14   |
| III. METHODOLOGY AND DESIGN . . . . .                  | 18   |
| Selection of Population . . . . .                      | 20   |
| Instrumentation . . . . .                              | 23   |
| Data Collection . . . . .                              | 23   |
| Data Analysis . . . . .                                | 24   |
| IV. PRESENTATION AND ANALYSIS OF DATA . . . . .        | 25   |
| Introduction . . . . .                                 | 25   |
| Job Relatedness . . . . .                              | 32   |
| Testing the Questions Generated by the Study . . . . . | 40   |
| V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS . . . . . | 49   |
| Summary . . . . .                                      | 49   |
| Conclusions . . . . .                                  | 50   |
| Recommendations . . . . .                              | 53   |
| Recommendations for Further Study . . . . .            | 56   |
| SELECTED BIBLIOGRAPHY . . . . .                        | 58   |
| APPENDIX - FOLLOW-UP QUESTIONNAIRE . . . . .           | 62   |

LIST OF TABLES

| Table   | Page |
|---|------|
| I. Percentage Returns on Follow-up Questionnaire<br>From Public and Private Schools . . . . .   | 20   |
| II. Employment Behavior Patterns of Students . . . . .  | 21   |
| III. Frequency Analysis of Public School Graduates'<br>Employment in Vocational-Technical Areas<br>(Office of Education Classification System) . . . . .                            | 26   |
| IV. Frequency Analysis of Public School Graduates'<br>Employment by Job Areas Defined by D.O.T.<br>Code (Dictionary of Occupational Title<br>Classification and Code) . . . . .     | 28   |
| V. Frequency Analysis of Private School Graduates'<br>Employment in Vocational-Technical Areas<br>(Office of Education Classification System) . . . . .                             | 29   |
| VI. Frequency Analysis of Private School Graduates'<br>Employment by Job Areas as Defined by D.O.T.<br>Code (Dictionary of Occupational Title<br>Classification and Code) . . . . . | 31   |
| VII. Frequency Analysis of Public School Graduates'<br>to Question of Job Relatedness to Educational<br>Training Received . . . . .   | 33   |
| VIII. Frequency Analysis of Public School Graduates' Responses<br>to Question of Job Relatedness to Educational<br>Training Received--Percentage . . . . .                          | 34   |
| IX. Frequency Analysis of Public School Job Relatedness<br>to Educational Training Received as Measured by<br>Office of Education Classification Code . . . . .                     | 36   |
| X. Frequency Analysis of Public School Job Relatedness<br>to Educational Training Received as Measured by<br>Office of Education Classification Code--<br>Percentage . . . . .      | 37   |
| XI. Public School Graduates' Employment by Vocational-<br>Technical Areas as Measured by OTIS Cluster<br>Classification System . . . . .  | 42   |

| Table   | Page |
|---|------|
| XII. Private School Graduates' Employment by Vocational-Technical Areas as Measured by OTIS Classification System . . . . .   | 43   |
| XIII. Chi-Square Analysis of Agriculture Graduates' Responses of Perceived Job Relationship to Actual Job Relationship Measured by H.E.W.-D.O.T. Code . . . . .           | 44   |
| XIV. Chi-Square Analysis of Distributive Education Graduates' Responses of Perceived Job Relationship to Actual Job Relationship Measured by H.E.W.-D.O.T. Code . . . . . | 45   |
| XV. Chi-Square Analysis of Health Education Graduates' Responses of Perceived Job Relationship to Actual Job Relationship Measured by H.E.W.-D.O.T. Code . . . . .        | 45   |
| XVI. Chi-Square Analysis of Home Economics Graduates' Responses of Perceived Job Relationship Measured by H.E.W.-D.O.T. Code . . . . .                                    | 46   |
| XVII. Chi-Square Analysis of Office of Education Graduates' Responses of Perceived Job Relationship to Actual Job Relationship Measured by H.E.W.-D.O.T. Code . . . . .   | 47   |
| XVIII. Chi-Square Analysis of Technical Education Graduates' Responses of Perceived Job Relationship to Actual Job Relationship Measured by H.E.W.-D.O.T. Code . . . . .  | 47   |
| XIX. Chi-Square Analysis of Trade and Industrial Graduates' Responses of Perceived Job Relationship to Actual Job Relationship Measured by H.E.W.-D.O.T. Code . . . . .   | 48   |

LIST OF FIGURES

| Figure   | Page |
|--|------|
| 1. Overview of Occupational Training Information System (OTIS) . . . . . | 19   |

## CHAPTER I

### THE PROBLEM

Changing manpower requirements necessitate corresponding changes in the nation's vocational-technical education programs. The ability to make decisions related to these program changes which will assist in bringing manpower supply and demand forces into equilibrium is considered by some experts to be the key to a more successful vocational-technical education system.

Presently, in most states, there is a dearth of reliable data in the area of vocational-technical education for planning purposes. This, along with the recognized need of millions of youths and adults for job training, has prompted federal legislation to encourage the development of statewide occupational information systems.

Oklahoma's desire to develop its economy has focused attention on the issue of human resources development in general and occupational training in particular. Consequently, an information system utilizing a procedure for matching manpower supply and demand in Oklahoma was initiated in August of 1968. This system is entitled the Occupational Training Information System (hereafter referred to as OTIS). Two reports in a series designed to assist Oklahoma manpower planners were issued by the project staff in January of 1969 and 1970. These reports presented detailed information on the state's public and private occupational training programs and matched enrollment in these programs with



manpower demand estimates. The U. S. Office of Education Program Codes and the Dictionary of Occupational Titles were used to facilitate matching of manpower supply and demand, respectively (1) (2).

#### The Purpose

This study is concerned with an empirical testing of the manpower supply and demand matching procedure utilized in the Occupational Training Information System. More specifically, this study will attempt to empirically test a systematic approach to matching manpower supply (training) and manpower demand (jobs). It is hoped that by focusing this study primarily on the analysis of jobs, job titles, and their relationship to training programs, a more reliable and accurate measure of graduate employment patterns can be made.

#### Need for Study

The Vocational Education Act of 1963, as amended in 1968, reflects the growing federal concern for a systematic evaluation of the nation's manpower training efforts (3) (4). This legislation indicates that programs offered to vocational-technical education students must be "realistic in the light of actual and anticipated opportunities for gainful employment and must be suited to their needs, interests, and abilities to benefit from such training."

The Vocational Education Amendments of 1968 and Congressional hearings on currently proposed legislation affecting vocational education specify not only that the allocation of training resources be based upon reasonable expectations of employment for the graduates, but also require a graduate follow-up study and the establishment of a meaningful

relationship between the graduate's training and his subsequent employment.

Many manpower researchers have identified the need for a re-evaluation of job and training program titles. Jakubauskas (31), in an article prepared in 1968 for a summer research institute on manpower surveys for vocational-technical education planning stated:

There are many aspects of research that have not as yet been developed, but hope to establish in the future. The most critical would be studies of changes in job content, research on internal rates of return for occupations, and most importantly the development of a system for evaluating the effectiveness of vocational education in meeting manpower needs.

In a national study made by Grant Venn and Robert J. Brown (1), it is stated:

Available labor force data and job information are not now fully adequate for educational planners, but the techniques for obtaining better data are constantly being improved. Good sound data about the relationship of the learning force to the world of work are lacking.

The challenge to vocational educators and manpower analysts becomes quite obvious in planning for, and gaging the effectiveness of, the vocational-technical education programs in relation to the manpower and occupational demands of the economy.

If an information system, such as OTIS, is to be valid, job and program titles must be placed in the most likely clusters so a representative picture can be made of initial employment patterns by Oklahoma vocational-technical graduates.

Lastly, there is a need to provide information which can be helpful in counseling potential vocational students. According to Mudzo (5), the establishment of an effective communication system is a necessity because information must be disseminated to the students informing them of training program objectives and the benefits they can derive from

training. Mudzo stated:

In any discussion or planning of a system relating to manpower training or human resource development, the prime element for consideration must be the individual person. This study recognizes the human needs, aspirations, emotions, and desires of the persons in the training system by placing the guidance function on the same hierarchal level as the management function. Like the management functions concern for organizational survival, the guidance function is concerned with the survival of the individual in an environment conducive to fulfilling his aspirations and goals. The basic objective of the guidance function is to aid the individual to achieve his goal as a human specie with a variety of wants, needs, and desires from life (5).

#### Research Question

This study will attempt to answer the following research questions:

- (1) Are graduates of Oklahoma vocational-technical programs securing employment in areas related to training as hypothesized in the 91 job and training title clusters utilized in the Occupational Training Information System?
- (2) Are there significant differences between the graduate's perception of the relationship between his training and subsequent employment and that relationship as measured by the job and title clusters utilized in the Occupational Training Information System?
- (3) Are the seven program service divisions (as defined by Vocational-Technical Education) valid or representative of the graduate employment patterns?
- (4) Are there significant areas of employment which are not included in the hypothesized job clusters referred to in question (1).

#### Limitations of the Study

The following are limitations of the study:

- (1) This ex-post-facto study will use data secured at one point in time from a population of approximately 14,000 Oklahoma vocational-technical school graduates.
- (2) This study is limited to the State of Oklahoma.
- (3) This study is limited by the accuracy of job titles reported by graduates.

#### Definition of Terms

Clustering: A grouping together of related job and program titles.

D.O.T.: Dictionary of Occupational Titles.

Employed: Those persons working at an occupation at least thirty-six hours per week and who receive a wage, salary, or fee.

Ex-Post-Facto: A study of data secured from a thing previously done.

H.E.W. Codes: The U. S. Office of Education Program Codes herein referred to as H.E.W. Codes.

Job Cluster: A grouping of jobs with common knowledge and skill requirements.

Job Nodule: A division of the job cluster covering specific skills or specific activities allowing job specialization or acquiring of a basic skill.

OTIS: Occupational Training Information System.

Occupational Education: Used interchangeably with vocational-technical education or adult retraining. An educational program of studies designed primarily to prepare pupils for entrance into a specific occupation or cluster of occupations (16).

Out-Migration: The voluntary movement of individuals from their community or state.

Post-High School: Instruction provided for individuals having completed grade 12, or equivalent in nature and difficulty, and any instruction of a comparable nature and degree of difficulty provided adults and out-of-school youths (16).

Public School: Any school supported by federal, state, or local tax funds.

Technical Education: Education program designed to produce technicians for work in the occupational area between that of the skilled employee and the professional employee such as engineers and scientists (16).

Technician: All persons engaged in work requiring knowledge of physical, life, engineering, and mathematical sciences comparable in knowledge acquired through Technical Institutes, Junior Colleges, or other formal post high school training, or through equivalent on-the-job training or experience (16).

Technician Graduate: A person awarded an associate degree upon completion of a two-year engineering or physical science related technical curriculum.

Vocational Maturity: Readiness to make occupational choices.

Vocational-Technical Education: Area of study in one of the following occupations: agriculture, distributive, health, home economics, office, technical, and trade and industrial, but excluding occupations generally considered professional or which require a baccalaureate or higher degree (16).

## CHAPTER II

### REVIEW OF LITERATURE

The review disclosed a dearth of information; however, the few relevant studies were divided into the following sections: (1) Historical Development, (2) Present Conditions, and (3) Future Trends and Developments.

#### Historical Development

Vocational-technical education has assumed new importance in the United States with the passage of the Vocational Education Act of 1963. The dramatic rise in youth unemployment and underemployment, the shortage of badly needed personnel in many technical, semiprofessional, and skilled occupations, the retraining and continuing education needs of workers displaced by automation, and the rising demand for new educational opportunities both at the secondary and postsecondary levels has forced a re-examination of this nation's neglect of occupational education. Passage of the Vocational Educational Amendments of 1968 was one outcome of Federal re-examination of governmental objectives relating to occupational education (4). The provisions of the amendments assured adequate funding for research and training in vocational education and manpower planning. Both the House Bill and the Senate Amendment set apart 10 per cent of the funds for research and training in

vocational education. Section 122-8, "Uses of Federal Funds", states:

Grants to States under this part may be used for ancillary services and activities to assure quality in all vocational education programs, such as teacher training and supervision, program evaluation, special demonstration and experimental programs, development of instructional materials, and improved State administration and leadership, including periodic evaluation of State and local vocational education programs and services in light of information regarding current and projected manpower needs and job opportunities (5).

The study by Roney and Braden, Occupational Education Beyond the High School in Oklahoma, was released in January, 1968 (6). This study secured relevant manpower supply and demand information from several sources and presented this information in usable form. However, the information was limited to the post-high school level and for a single point in time. Subsequently, the Manpower Research and Training Center at Oklahoma State University was approached to react in detail as to the feasibility of a statewide research project which could implement a strategy for economic development and the training of a skilled labor force.

The study of manpower requirements and occupational programs in Oklahoma was initiated in August of 1968. The over-all purpose of this project was to develop and initiate a systematic, continuous, and detailed Occupational Training Information System (OTIS) as a better data base for encouraging changes in Oklahoma's State Plan for Vocational Education. The results of the OTIS study were first released in the report Manpower Requirements and Occupational Programs in Oklahoma in January, 1969.

Relatively little had been done in vocational systems research

previous to these studies. One of the most consistent findings from literature relative to vocational-technical education has been the limited amount of research done. A 1960 review by Cooper (7) stated:

The literature of technical and semi-professional education tends toward generalization and observation rather than empirical data. The limited number of studies available dealt primarily with (a) the need for such training, (b) the types of institutions offering it, and (c) analysis of specific programs.

In 1964, Roney (8) found the situation to be very similar, and stated:

Literature pertinent to this study was found to be largely descriptive by nature. Reports of controlled experimental research appeared to be limited, and when such reports were available, they were short, highly specific, and localized projects.

Larson (9) reported a similar conclusion from a study made by the Center for Research and Leadership Development in Vocational-Technical Education at Ohio State University in 1966. In the preface to the review he states:

Since technical education is a relatively new field, the amount of significant, sophisticated research is quite limited. However, much helpful information for research is contained in reports, conference summaries, articles, and other publications.

The need for appropriate and accurate information was emphasized by the National Center for Educational Statistics (N.C.E.S.). N.C.E.S. states:

The starting point for the development or improvement of an information system is the determination of need. Needs for information about curriculum and instruction should help identify the objectives of the information system; these objectives, in turn, should lead to identification of items required and their priorities: Needed is information for purposes of evaluation, curriculum improvement, scheduling,



assisting pupils, reporting, long-range planning, and other administrative functions, etc. (16).

The availability and use of appropriate and accurate information can greatly enhance the effectiveness of educational decision making locally, regionally, statewide, and nationally.

The need of appropriate and accurate information was cited by Maurice Graney (10) in 1964. In his book, The Technical Institute, Graney states:

Factual data relative to the characteristics of vocational-technical education students is scarce. Speculation abounds with much of the information containing inaccuracies, prejudices, and frequently stated conclusions based on assumptions (5).

Studies providing limited information about vocational-technical graduates in Oklahoma were made by the Oklahoma State Regents for Higher Education in 1965, and the Manpower Reports of 1964 and 1968 by the Oklahoma Employment Security Commission. Phillips provides information on the measurement of the general aptitude and ability of the entering vocational-technical student (6). Out-migrating data and factors affecting interstate mobility can be secured from a study made by Sherrell (7), completed in 1969. An assessment of the Oklahoma private school occupational training programs with implication for statewide planning was made by Krishan Paul (8).

Since factual information, directly related to vocational-technical education, is lacking and studies made in other disciplines are contradictory, the more knowledge that can be gained about the vocational-technical graduate, the better decisions can be made regarding program needs or curriculum changes.

### Present Conditions

It is hard to evaluate something that is still in the infancy stage, and this is the condition of most state systems for evaluating the effectiveness of vocational education in meeting manpower needs. Most active attempts to develop a statewide manpower system were made by Braden (29), in Oklahoma; Malinski (32), in Minnesota; Morton (33), in Texas; Starr (34), in Ohio; Jakubauskas (31), in Iowa; Arnold (35), in Pennsylvania, and Fasold (36), in Oregon. There is agreement among this group that a systemic approach is needed to improve the effectiveness of manpower development efforts. The approach used has taken various forms, but the emerging, more realistic systems are those conceived by Braden in Oklahoma, Arnold in Pennsylvania, and Fasold in Oregon. The present status of conditions in Oklahoma are available in a new report released in 1970 by Braden and the OTIS project entitled Occupational Training Information System, Cycle Two Report -- A Second Yearly Report Complete With System Documentation (30).

The Pennsylvania Department of Public Instruction released in 1969 a study addressed to an analysis of the operating Vocational-Technical program since the passage of the Vocational Education Act of 1963. Its purpose was to determine what direction the vocational-technical program should take in light of economic trends and manpower needs of the state and what the projected needs and costs might be up to 1975. The nature and pattern of the report included a five-year analysis of graduates (supply) from nine principal occupational training agencies and programs

involving 164 occupational classifications. Economic and projected trends of the Pennsylvania economy were analyzed and described. By projecting economic trends, manpower demands and needs were determined. Projected and unmet occupational needs furnished the basis for immediate program planning and projected program expansion to bring the annual supply of trained manpower more nearly into agreement with the projected demand (35).

The Oregon study took a broad approach to the improvement of programs and curriculums with suggestions for integrating occupational and academic educational programs at the secondary and post-high school levels. It provides guidelines to be used for structuring total programs or modifying existing programs (36).

The guidelines suggest approaches to the long-run attainment of four basic objectives. They are to provide:

- (1) Meaningful occupational education, available to all students.
- (2) Opportunities for students to achieve entry level employment competency while in the secondary education complex.
- (3) Occupational education which is appropriate to the objectives of students who will continue their education beyond the high school.
- (4) Occupational education at the secondary level which is neither narrowly restrictive nor excessively specialized.

These objectives combine to produce essentially four directions or areas of emphasis.

- (1) Utilization, where appropriate, of curriculums for grades eleven and twelve which are centered upon the concept of occupational clusters, and which have been selected through analysis of occupational needs in Oregon.
- (2) Attainment of continuous articulation of occupational education offerings from grade seven through grade twelve and into post-high school education and training.
- (3) Vastly increased integration of occupational education, guidance and counseling, and the traditional "academic" disciplines.
- (4) Application of the concepts of "cooperative functioning of educational agencies" and "area facilities" where factors of student population and resource limitations indicate the need for them.

The development of the program centered around the statistical analysis of Oregon manpower supply and demand data with projections made of forecast needs in the 70's. Educational needs followed cluster identification and analysis of occupations to determine required skills and knowledge. The tentative identification of clusters was made by a committee appointed from the staff of the Division of Community Colleges and Vocational Education. The D.O.T. codes and occupational information developed by the state Department of Employment identified tentative demand clusters.

The tentative supply and demand clusters were submitted to supervisors within the Division of Community Colleges and Vocational

Education and other consultants for further analysis and recommendations. Minimum numerical requirements adopted by the committee for inclusion of a tentative cluster were present employment in Oregon of 10,000 workers and a forecast need for 2,000 workers by 1970.

With the implementation of the Vocational Education Amendments of 1968, most states adopted some systematic approach of providing manpower information to state-local program planners and Federal agencies. Limited distribution of these reports, because of size and costs, makes analysis and study an impossibility.

#### Future Trend and Developments

Technological change has produced a dramatic challenge to this nation's political, economic, social, and educational institutions. Although the full scope of this challenge is unclear and uncertain, the requirements of postsecondary education must increase in preparing men and women for entry into the changed and changing world of technological work. Grant Venn (37) states:

Unless far more and far better education on the semi-professional, technical, and skilled levels is soon made available to greater number of citizens, the national economy and social structure will suffer irreparable damage.

Technological change places education squarely between man and his work in the continuum - man, education, and work. This relationship exists for all men and all work as technology today in effect dictates the role that education must play in preparing man for work. Present postsecondary education has directed its efforts and attention on the 20 per cent of students who go through college. Future efforts will require more attention on the 80 per cent who will not graduate from

college. Turned out of an educational system oriented toward someone else's college degree rather than their own needs, and entering a labor market whose jobs require constantly higher levels of education and skill development, student employment prospects are bleak. Youth unemployment rates are already higher than during the depression years and continues to climb month-after-month.

The most significant aspect of technological change is not simply a case of new sets of social or economic relationships replacing older ones, but of the new ones being replaced at a faster and faster rate, with adopting to changes a necessity for survival. The concept of change is not new; what is new is the change in the rate of change. This has come as a result of the tremendous increase in the rate of scientific activity promoted in part by the present educational system and Federal expenditure for research and development.

Economist John Diebold and Donald Michael (38) conceive future changes produced by the new technology as "so different in degree as to be a profound difference in kind". Computers and automation will produce profound results on the labor market. To date, the full impact of "technological unemployment" has not registered on the American conscience. It has produced major changes in labor requirement in such occupational areas as agriculture, mining, chemical, aircraft, communications, metals, transportation and some service occupations. It seems only a matter of time until a substantial part of the present national employment succumbs to technological advance. Many of the present tasks of farm workers, laborers, semiskilled operatives, service workers, craftsmen, and middle management administrators have a high likelihood of technological elimination.

Work is becoming more cognitive. The shift from manual to cognitive work is reflected in the long-term changes in the occupational distribution of the labor force.

The Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training, by the U. S. Department of Labor indicates that employment by major occupational groups in 1947, 1964, and projected figures for 1975 are as follows: White-collar workers (professional, technical, clerical, etc.) increased from 34.9 per cent of the total labor force in 1947 to 44.2 per cent in 1964 and is predicted to reach 48.3 per cent in 1975. Blue-collar workers (craftsmen, operatives, laborers, etc.) declined from 40.7 per cent in 1947 to 36.3 per cent in 1964 and an anticipated decline to 33.7 per cent in 1975. Service workers have increased from 10.4 per cent in 1947 to 13.2 per cent in 1964 and a projected 14.1 per cent in 1975. Farmers and farm managers, laborers, and foremen accounted for 14 per cent of the labor force in 1947 and this declined to 6.3 per cent in 1964 and, with the shift in population from rural to urban, the projected figure is 3.9 per cent in 1975. Reports of the 1970 census figures showed a 33 per cent decline in the farm population from 1960 to 1970.

Manpower specialists report the six immediate and future occupational areas are: electronics, repair services, construction, manufacturing, health, and transportation. Employment opportunities in the laborer and semiskilled operative jobs, the jobs requiring less education and skill development, are becoming severely limited. These jobs are the traditional entry point for most young and untrained workers. The present and future technological economy has little to offer the

untrained, under-educated would be worker. Job entry, job upgrading, and continued employment become increasingly a matter of education. A panel of consultants viewing future educational training and retraining, states:

It is becoming increasingly clear that there is no real assurance now that the mastery of an occupation, once achieved, will last any worker a lifetime. Although jobs may change, a worker who has mastered the skill of a trade or occupation and who has kept himself abreast of new techniques and developments can reasonably expect to continue in his trade through his working life. Pre-employment training of youth must, therefore, provide a solid occupational foundation. In addition, the potential member of the labor force must be well aware of his responsibilities for his own self-development if he is to continue to keep up-to-date in his occupation. Since more and more workers will need a program of lifelong learning, continuing educational opportunities must be provided to cope with occupational change. Vocational educators must train more broadly for career patterns, for a lifelong sequence of employment opportunities (39).

The review of literature disclosed a dearth of information. The relevant studies were largely descriptive by nature. Most relevant, were State manpower studies utilizing Federal funds provided for research and program evaluation in vocational education and manpower planning as per the Vocational Education Amendment, of 1968. Conclusions drawn from these studies were that future changes in manpower demand estimates and corresponding changes in vocational-technical education programs will necessitate a valid manpower supply and demand information system and a matching procedure which will assist in bringing the manpower supply and demand forces into equilibrium. Of the studies surveyed, none provided an empirical testing of the manpower supply and demand matching procedure. Thus, this study will be the first effort made to matching Oklahoma manpower supply and demand.



## CHAPTER III

### METHODOLOGY AND DESIGN

The purpose of this study was an empirical testing of a systematic approach to matching manpower supply and demand as utilized in the Occupational Training Information System. The primary data source for this research was derived from the OTIS project previously referred to in Chapters I and II. Figure 1 provides an overview of the entire OTIS project.

This study is representative of ex-post-facto research. The ex-post-facto type of research usually follows two patterns of study: exploratory and descriptive or a combination of the two techniques. This research is characterized by observations of the dependent variables in retrospect to their possible relations, and effect on, the independent variables. Kerlinger (9), in discussing ex-post-facto type of research, described exploratory studies as an attempt to explain a situation, test a theory, or draw inferences to the relation between the cause and its effect. Exploratory research is further divided into diagnostic and experimental methods. The diagnostic study searches for possible causes in evaluating a situation. The experimental type of study does not lend itself to this particular study.

The over-all design of this study involved follow-up of graduates from vocational and technical programs utilizing a mail questionnaire.

OCCUPATIONAL TRAINING INFORMATION SYSTEM

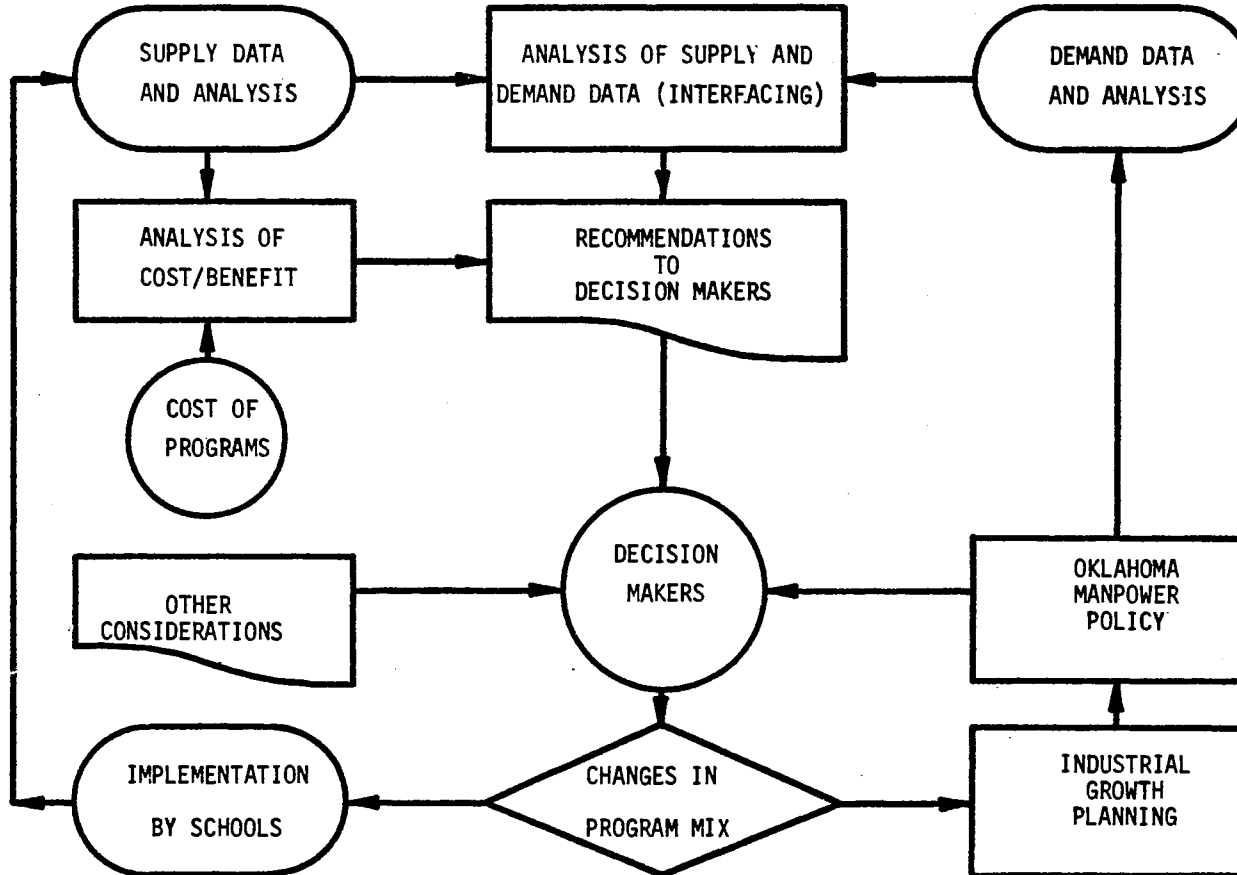


Figure 1. Overview of Occupational Training Information System (OTIS)

Data from the mailed questionnaire were analyzed in order to determine the relationship between training programs and initial employment patterns.

#### Selection of Population

The subjects for this study were derived from a population of 13,775 public and the 3,313 private school students who graduated from vocational-technical programs in the State of Oklahoma in May, 1969. A mail questionnaire was sent to all graduates and usable responses were received from 4,373 public and 1,264 private school graduates as shown in Table I.

TABLE I  
PERCENTAGE RETURNS ON FOLLOW-UP QUESTIONNAIRE  
FROM PUBLIC AND PRIVATE SCHOOLS

|                          | Public School |          | Private School |          |
|--------------------------|---------------|----------|----------------|----------|
|                          | Number        | Per Cent | Number         | Per Cent |
| Total Followed Up        | 13,775        |          | 3,313          |          |
| Total Returns            | 5,242         | 38       | 1,475          | 44       |
| Total Not Usable Returns | 869           | 6        | 211            | 6        |
| Total Usable Returns     | 4,373         | 32       | 1,264          | 38       |

The distribution of the 4,373 public and the 1,264 private vocational-technical graduates' employment behavior patterns is shown in Table II. Of these, 1,121 public and 903 private school graduates were (1) employed full-time and (2) reported their job titles. Thus, they constituted the subjects for this study.

TABLE II  
EMPLOYMENT BEHAVIOR PATTERNS OF STUDENTS

| No. | Possible Responses   | Public School |          | Private School |          |
|-----|--|---------------|----------|----------------|----------|
|     |  | Number        | Per Cent | Number         | Per Cent |
| 1   | Working full-time in occupation for which trained                | 567           | 12.97    | 445            | 35.21    |
| 2   | Working full-time in occupation related to the field of training | 334           | 7.64     | 208            | 16.46    |
| 3   | Working full-time in occupation not related to the training      | 527           | 12.05    | 269            | 21.28    |
| 4   | Continuing full-time in school in the field related to training  | 935           | 21.38    | 45             | 3.56     |
| 5   | Continuing full-time in school in non-related field              | 687           | 15.71    | 32             | 2.53     |
| 6   | Armed Services   | 249           | 5.69     | 54             | 4.27     |
| 7   | Employed part-time, but not attending school                     | 323           | 7.39     | 26             | 2.06     |
| 8   | Unemployed, seeking employment                                   | 389           | 8.90     | 111            | 8.78     |
| 9   | Unemployed, not seeking employment                               | 216           | 4.94     | 55             | 4.35     |
| 10  | No response  | 146           | 3.33     | 19             | 1.50     |
|     | Total  | 4,373         | 100.00   | 1,264          | 100.00   |

A computer selected random sample of one hundred students was identified from among the non-respondents in order to check for statistical bias. Ninety-one responses were secured by telephone and personal contacts; two persons had died and seven had moved leaving no forwarding address. A Chi-square test was performed on relevant items comparing the sub-sample with the total population of respondents. No statistically significant difference was found between the sub-sample of respondents and the total population of respondents. These findings were reported in detail in the OTIS Cycle II Report (30).

The major steps utilized in analyzing the 1,121 public and 903 private school graduates were as follows:

- (1) The Dictionary of Occupational Titles (D.O.T.) was utilized to assign codes to job titles reported by subjects (2).
- (2) The titles reported by subjects were also classified into one of seven vocational-technical education program service divisions; i.e., agriculture, distributive, health, home economics, office, technical, or trade and industrial education.
- (3) D.O.T. job title codes determined in (1) above were compared against the program service division determined in (2) above to ascertain if the student's job title was "in" or "out" of the 91 job clusters utilized in the OTIS Cycle II Report published in January, 1970 (30).
- (4) D.O.T. job title codes found to be outside of the 91 job clusters were further analyzed to ascertain any

significant intermixing of initial employment patterns between program service divisions.

#### Instrumentation

The follow-up questionnaire (Appendix A) was printed on a reply-paid post card. This questionnaire was divided into five sections which were designed to obtain information on:

- (1) occupational program completed,
- (2) employment status: working full-time, continuing full-time in school, armed services, employed part-time, or unemployed,
- (3) job title and location of job,
- (4) salary range, and
- (5) student rating of occupational program.

A system was used which identified each student to a unique number on the mailed questionnaire. Student and program identity was greatly enhanced by this method. This permitted the respondent to be identified in terms of the occupational program in which he was previously enrolled.

#### Data Collection

The response on the initial mailing in September of 1969 was 10 per cent in the case of public school graduates and 15 per cent from private school graduates. One month after the initial mailing of the questionnaire, a reminder was sent to all of the non-respondents in the form, once again, of a reply-paid post card. This reminder resulted in another 10 per cent return from both public and private school

graduates. A third and final reminder was mailed in November of 1969. A 14 per cent return was received from public school graduates and an 18.5 per cent return was received from private school graduates. Usable returns, as was shown in Table I, were 32 per cent for public and 38 per cent for private school graduates.

#### Data Analysis

Responses from the follow-up questionnaire were used to obtain data regarding the student's job and to identify him with the program from which he had graduated.

In this study, two methods of data analysis were utilized. The primary statistic was the Chi-square. In supplemental analyses, percentages and frequency distributions were employed where appropriate. Tables were prepared so that significant patterns and relationships could be presented in detail.

The computer facilities of the Oklahoma State University Computer Center were used to facilitate data analysis.

## CHAPTER IV

### PRESENTATION AND ANALYSIS OF DATA

#### Introduction

The analysis of data presented in this chapter should be approached with two key thoughts in mind. How effectively are present vocational-technical programs in meeting manpower needs? Are the present vocational-technical programs accomplishing their purpose?

The purpose of vocational-technical education, as stated in the Vocational Education Amendments of 1968, is to provide all persons with

... ready access to vocational training in light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interests, and ability to benefit from training.

The foregoing statement implies a vocational education system which offers a wide range of programs in many occupational areas at many skill levels, and that the range of these programs should be determined by the individuals who need and request vocational education and by the needs of society.

How effective are the present vocational-technical programs meeting the employment needs of individuals in Oklahoma? More specifically, are graduates finding jobs in fields related to training?

Table III identifies the student employment patterns by areas of training. These figures include only graduates working full time.

A comparison of student employment by vocational areas shows that



TABLE III

FREQUENCY ANALYSIS OF PUBLIC SCHOOL GRADUATES' EMPLOYMENT IN VOCATIONAL-TECHNICAL AREAS  
(OFFICE OF EDUCATION CLASSIFICATION SYSTEM)

| Training by<br>Program<br>Service<br>Area | Employment Patterns by Program Service Area |                           |        |                   |        |           |                         |              | Total |
|---|---|---------------------------|--------|-------------------|--------|-----------|-------------------------|--------------|-------|
|   | Agriculture                                 | Distributive<br>Education | Health | Home<br>Economics | Office | Technical | Trade and<br>Industrial | Unclassified |       |
| Agriculture                               | 3   | 13                        | 3      |                   | 6      |           | 40                      | 14           | 79    |
| Distributive<br>Education                 | 2   | 22                        | 3      |                   | 26     | 2         | 14                      | 7            | 76    |
| Health                                    |   | 3                         | 201    |                   | 6      |           | 2                       | 2            | 214   |
| Home<br>Economics                         | 2   | 12                        | 8      | 1                 | 68     | 1         | 31                      | 8            | 131   |
| Office                                    |   | 7                         |        | 2                 | 152    | 2         | 22                      | 6            | 191   |
| Technical                                 | 4   | 2                         | 2      |                   | 6      | 29        | 18                      | 8            | 69    |
| Trade and<br>Industrial                   | 10  | 33                        | 14     |                   | 32     | 10        | 230                     | 32           | 361   |
| TOTAL                                     | 21  | 92                        | 231    | 3                 | 296    | 44        | 357                     | 77           | 1,121 |

the areas of trade and industrial, office, and health education account for 357, 296, and 231 employed graduates, respectively, or 78 per cent of total employment. Forty, or 51 per cent, of those trained in agriculture secured jobs in trade and industrial occupations. Sixty-eight, or 52 per cent, of the graduates from home economics secured jobs in office occupations.

Programs related to aviation, health, cosmetology, electrical, and other occupations requiring certification had a much higher percentage of their graduates in employment areas directly related to their training program.

Table IV reveals the distribution of job titles by vocational-technical service areas as classified by D.O.T. codes. This represents the different job titles taken by public school graduates in order to ascertain the number of titles being utilized outside the clusters. Of the 384 different job titles utilized by graduates, 63, or 16 per cent, fell outside the 91 clusters and, therefore, could not be classified.

Data on the private school sector in Oklahoma included graduates from 51 private institutions representing approximately 90 per cent of the total students being trained in private schools. Table V identifies the student employment patterns by areas of training. These figures include only graduates working full time.

Training programs in private schools are identified by using only the office and the trade and industrial service divisions as most private schools are classified as technical, trade, and business schools (13).

A comparison by vocational areas indicates that 82 per cent of the graduates are from trade and industrial, office, and technical

TABLE IV

FREQUENCY ANALYSIS OF PUBLIC SCHOOL GRADUATES' EMPLOYMENT BY JOB AREAS DEFINED BY D.O.T. CODE  
(DICTIONARY OF OCCUPATIONAL TITLE CLASSIFICATION AND CODE)

| Training by<br>Program<br>Service<br>Area | Employment Patterns by Program Service Area |                           |        |                   |        |           |                         |              | Total |
|---|---|---------------------------|--------|-------------------|--------|-----------|-------------------------|--------------|-------|
|   | Agriculture                                 | Distributive<br>Education | Health | Home<br>Economics | Office | Technical | Trade and<br>Industrial | Unclassified |       |
| Agriculture                               | 3   | 5                         | 3      |                   | 4      |           | 22                      | 9            | 46    |
| Distributive<br>Education                 | 1   | 8                         | 3      |                   | 14     | 1         | 11                      | 7            | 45    |
| Health                                    |   | 3                         | 8      |                   | 5      |           |                         | 2            | 20    |
| Home<br>Economics                         | 2   | 4                         | 3      | 1                 | 19     | 1         | 12                      | 8            | 50    |
| Office                                    | 3   |                           |        | 2                 | 26     | 2         | 18                      | 6            | 57    |
| Technical                                 | 4   | 2                         | 2      |                   | 5      | 5         | 10                      | 8            | 36    |
| Trade and<br>Industrial                   | 6   | 15                        | 4      |                   | 17     | 8         | 57                      | 23           | 130   |
| TOTAL                                     | 19  | 37                        | 23     | 3                 | 90     | 17        | 132                     | 63           | 384   |

TABLE V

FREQUENCY ANALYSIS OF PRIVATE SCHOOL GRADUATES' EMPLOYMENT IN VOCATIONAL-TECHNICAL AREAS  
(OFFICE OF EDUCATION CLASSIFICATION SYSTEM)

| Training by<br>Program<br>Service<br>Area   | Employment Patterns by Program Service Area |                           |        |                   |        |           |                         |              | Total |
|---|---|---------------------------|--------|-------------------|--------|-----------|-------------------------|--------------|-------|
|   | Agriculture                                 | Distributive<br>Education | Health | Home<br>Economics | Office | Technical | Trade and<br>Industrial | Unclassified |       |
| Business<br>and<br>Office                   |   | 21                        | 8      | 2                 | 256    | 1         | 33                      | 16           | 337   |
| Technical<br>and<br>Trade and<br>Industrial | 3   | 25                        | 2      | 1                 | 36     | 91        | 325                     | 83           | 556   |
| TOTAL                                       | 3   | 46                        | 10     | 3                 | 292    | 92        | 358                     | 99           | 903   |

educational areas, with major concentration in trade and office skills. Two hundred and fifty-six, or 76 per cent, of the graduates from the business and office educational areas secured jobs in their area of training. Three hundred and twenty-five, or 74 per cent, of the graduates from technical and trade schools were employed in jobs related to their training. These high percentages of placement in jobs related to training are comparable to the public school sector programs which train for specific job skills and/or require certification, e.g., health occupations.

In the introduction to "Office Occupations" in the Standard Terminology for Curriculum and Instruction in Local and State School Systems, it is stated that office education is designed to "... lead to employment and/or advancement of individuals in occupations in public or private enterprises or organizations related to the facilitating function of the office (11). Office education training programs are meeting this educational objective in both the private and public school sectors. The same statement can be made regarding the trade and industrial education programs.

The four educational areas of business and office, technical, trade and industrial, and health contribute the majority of graduates securing full time employment in jobs related to their training.

Table VI reveals the distribution of job titles by vocational-technical service areas as classified by D.O.T. codes. This represents the different job titles taken by private school graduates in order to ascertain the number of titles being utilized outside of the clusters. Of the 227 different job titles utilized by graduates, 64, or 28

TABLE VI

FREQUENCY ANALYSIS OF PRIVATE SCHOOL GRADUATES' EMPLOYMENT BY JOB AREAS AS DEFINED BY D.O.T. CODE  
(DICTIONARY OF OCCUPATIONAL TITLE CLASSIFICATION AND CODE)

| Training by<br>Program<br>Service<br>Area   | Employment Patterns by Program Service Area |                           |        |                   |        |           |                         |              | Total |
|---|---|---------------------------|--------|-------------------|--------|-----------|-------------------------|--------------|-------|
|   | Agriculture                                 | Distributive<br>Education | Health | Home<br>Economics | Office | Technical | Trade and<br>Industrial | Unclassified |       |
| Business<br>and<br>Office                   |   | 11                        | 4      | 2                 | 27     | 1         | 17                      | 15           | 77    |
| Technical<br>and<br>Trade and<br>Industrial | 3   | 17                        | 1      | 1                 | 21     | 16        | 42                      | 49           | 150   |
| TOTAL                                       | 3   | 28                        | 5      | 3                 | 48     | 17        | 59                      | 64           | 227   |

per cent, fell outside the 91 clusters and, therefore, could not be classified.

The employment patterns of the public and private school graduates are similar but the major difference is the degree of training and the entry level of employment of the graduate. This reflects the influence of more training in the private schools in technical, skilled, and semi-skilled job areas.

#### Job Relatedness

The method used in this study to evaluate occupational training (supply) and job opportunities (demand) has been to approach the trainee. This method has definite advantages and some limitations and raises a question: What constitutes "related to training" when viewed by the trainee and when classified by H.E.W. educational codes?

Table VII reveals the student response to the question of job relatedness. Table VIII reveals the same data, but for ease of comparison the student response is tabulated on a percentage basis. An analysis of the job areas in which graduates secured jobs indicates a wide spectrum of employment; however, the more specialized the training for specific occupational skills, the less the tendency towards employment outside the area of training. It is recognized that home economics education (useful) students from the public schools are often excluded from studies as their stated career objectives do not relate directly to the labor market.

Since the Vocational Education and Occupations report, prepared by the U. S. Department of Health, Education, and Welfare, and the U. S. Department of Labor, is one of the most documented approaches to

TABLE VII

FREQUENCY ANALYSIS OF PUBLIC SCHOOL GRADUATES' RESPONSES TO QUESTION OF  
JOB RELATEDNESS TO EDUCATIONAL TRAINING RECEIVED

| Graduate<br>Responses       | Program Service Area |           |        |          |        |       |       | Total |
|-----------------------------|----------------------|-----------|--------|----------|--------|-------|-------|-------|
|                             | Agric.               | Dist. Ed. | Health | Home Ec. | Office | Tech. | T & I |       |
| Yes--In Area<br>Trained     | 21                   | 26        | 193    | 31       | 88     | 34    | 177   | 560   |
| Yes--But In<br>Related Area | 16                   | 19        | 12     | 25       | 53     | 17    | 63    | 205   |
| No--<br>Non-Related         | 42                   | 31        | 9      | 75       | 50     | 28    | 121   | 356   |
| TOTAL                       | 79                   | 76        | 214    | 131      | 191    | 69    | 361   | 1,121 |



TABLE VIII

FREQUENCY ANALYSIS OF PUBLIC SCHOOL GRADUATES' RESPONSES TO QUESTION OF JOB RELATEDNESS TO EDUCATIONAL TRAINING RECEIVED--PERCENTAGE

| Graduate Responses       | Program Service Area |           |        |          |        |       |       |
|--------------------------|----------------------|-----------|--------|----------|--------|-------|-------|
|                          | Agric.               | Dist. Ed. | Health | Home Ec. | Office | Tech. | T & I |
| Yes--In Area Trained     | 27                   | 34        | 90     | 25       | 46     | 49    | 50    |
| Yes--But In Related Area | 20                   | 25        | 6      | 19       | 28     | 25    | 17    |
| None--Non-Related Area   | 53                   | 41        | 4      | 56       | 26     | 26    | 33    |
| TOTAL PERCENTAGE         | 100                  | 100       | 100    | 100      | 100    | 100   | 100   |

matching of educational output with occupational requirements, this approach is used in the preparation of this report.

Table IX is a frequency distribution of the previous data showing the job relatedness to educational training received as measured by H.E.W. classification codes. Table X presents the same data, but for ease of comparison the student response is tabulated on a percentage basis.

When summarized by program service areas, the following findings can be presented regarding full-time employed graduates of vocational-technical training programs.

Agriculture: Fifty-three per cent of students working full time stated they were working in an occupation not related to training. Twenty per cent reported they were working in a related area. Seventeen per cent felt they were working in area trained. However, measured by the H.E.W. codes, only four per cent were actually employed in area trained, 78 per cent were in non-related employment, with 18 per cent in jobs not classified in the H.E.W. job clusters. This difference in the student's perception of his job can best be illustrated by this example. Some students were employed as auto or diesel mechanics, or as welders. They perceived their employment in their area of training since they had received their training in farm mechanics or welding courses. Using H.E.W. codes, however, auto-diesel mechanics and welders are classified under trade and industrial education. Diversity of employment was noted by the fact that 79 graduates were employed in 46 different D.O.T. coded jobs.

Distributive Education: These 76 students were employed in 45 different

TABLE IX

FREQUENCY ANALYSIS OF PUBLIC SCHOOL JOB RELATEDNESS TO EDUCATIONAL TRAINING RECEIVED  
AS MEASURED BY OFFICE OF EDUCATION CLASSIFICATION CODE

| Classified by<br>H.E.W. Code | Program Service Area |           |        |          |        |       |       | Total |
|------------------------------|----------------------|-----------|--------|----------|--------|-------|-------|-------|
|                              | Agric.               | Dist. Ed. | Health | Home Ec. | Office | Tech. | T & I |       |
| Yes--<br>In Program Area     | 3                    | 22        | 201    | 1        | 152    | 29    | 230   | 638   |
| No--In<br>Non-Program Area   | 62                   | 47        | 11     | 122      | 33     | 32    | 99    | 406   |
| Unclassified                 | 14                   | 7         | 2      | 8        | 6      | 8     | 32    | 77    |
| TOTAL                        | 79                   | 76        | 214    | 131      | 191    | 69    | 361   | 1,121 |

TABLE X

FREQUENCY ANALYSIS OF PUBLIC SCHOOL JOB RELATEDNESS TO EDUCATIONAL TRAINING RECEIVED  
AS MEASURED BY OFFICE OF EDUCATION CLASSIFICATION CODE--PERCENTAGE

| Classified by<br>H.E.W. Code | Program Service Area |           |        |          |        |       |       |
|------------------------------|----------------------|-----------|--------|----------|--------|-------|-------|
|                              | Agric.               | Dist. Ed. | Health | Home Ec. | Office | Tech. | T & I |
| In Program Area              | 4                    | 30        | 94     | 0.8      | 80     | 42    | 64    |
| Non-Program Area             | 78                   | 62        | 5      | 93.0     | 17     | 46    | 27    |
| Unclassified                 | 18                   | 8         | 1      | 6.2      | 3      | 12    | 9     |
| TOTAL<br>PERCENGAGE          | 100                  | 100       | 100    | 100      | 100    | 100   | 100   |

job areas. Forty-one per cent perceived their job as being non-related to training with 25 per cent feeling their jobs were related to training. Twenty-four per cent viewed their job in area of training. By H.E.W. codes, 30 per cent were employed in their program area with 62 per cent not employed in area of training. Eight per cent were employed in jobs not classified by H.E.W. Distributive education students found their greatest area of employment in office occupations and trade and industrial occupational areas.

Health: These students trained for specific job skills perceived their jobs and job relatedness with no difficulty. Four per cent stated they were employed in non-related areas with six per cent in jobs related to training. By H.E.W. codes, five per cent were not employed in program area, and 94 per cent were in health-coded jobs. One per cent were in jobs unclassified by H.E.W. The 214 students were employed in 20 D.O.T. coded jobs.

Home Economics: The 131 students surveyed were employed in 50 different job areas. By H.E.W. codes, only one per cent were employed in program of training, and 93 per cent were employed in non-related jobs. Six per cent were in jobs not classified by H.E.W.

Fifty-six per cent of the students viewed their jobs as not related to training, 19 per cent saw a relationship between their job and training received. Twenty-five per cent felt they were employed in area of training. These distinctive differences may be justified by this example. The sewing machine operator course is conceived as being in home economics. However, by H.E.W. codes when this skill is applied in

industry for garment and other industrial seamstresses it is coded as trade and industrial occupational area.

The largest percentage of these students secured jobs in office or trade and industrial job areas. As a result, when classified by H.E.W. codes, 93 per cent were employed in non-related job areas, one per cent in area of training, and six per cent in job areas that are not classified by H.E.W.

Office: The 191 graduates were employed in 57 D.O.T. jobs. Twenty-six per cent perceived their jobs as non-related to training with 28 per cent perceiving some relationship. Forty-six per cent felt they were employed in area of training. By H.E.W. codes, 80 per cent were employed in office occupations, 17 per cent in non-related jobs, and 3 per cent in jobs not classified by H.E.W. If the 46 per cent who viewed their jobs as in area of training are added to the 28 per cent who saw a job-training relatedness, these would total 74 per cent as compared to H.E.W.'s classification of 80 per cent.

Technical: Twenty-six per cent of the graduates viewed their jobs as being non-related with 25 per cent feeling that their jobs were related to area of training. Forty-nine per cent felt that their jobs were in the area of training. By H.E.W. codes, 42 per cent were employed in area of training, 46 per cent were not employed in area of training, and 12 per cent were in jobs not classified by H.E.W. codes.

The area of employment closely related to technical education is trade and industrial education. When these two areas are added together

68 per cent of the graduates would view their employment as related to training by H.E.W. standards. This 68 per cent would be comparable to the 74 per cent who viewed their jobs as being related to training. The 69 graduates were employed in 36 D.O.T. jobs with technical jobs classified in five job areas of employment. Jobs in trade and industrial job classifications were in ten D.O.T. job codes.

Trade and Industrial Education: The largest vocational area, with 361 graduates, was also the largest for the number of D.O.T. job code classifications - 130. Thirty-three per cent of the graduates considered themselves employed in jobs not related to training. Seventeen per cent felt that there was a relatedness between job and training received, with 50 per cent conceiving their employment as being in the area of training. By H.E.W. codes, 64 per cent were employed in area of training with 27 per cent employed in jobs not classified by H.E.W.

If the 50 per cent who viewed their employment in area of training is added to the 17 per cent who saw a job training relatedness, this would total 67 per cent as compared to the 64 per cent measured by H.E.W. codes.

#### Testing the Questions Generated by the Study

The purpose of this study was concerned with an empirical testing of the manpower supply and demand matching procedure utilized in the Occupational Training Information System. The establishing of objective criterion for matching manpower supply (training) and manpower demand

(jobs) was initiated by the Occupational Training Information System.

The above analysis of data yielded the following observations as they relate to the research questions posed in this study:

Question 1: Are graduates of Oklahoma vocational-technical programs securing employment in areas related to training as hypothesized in the 91 job and training title clusters utilized in the Occupational Training Information System?

Observation: Data used by the OTIS project for classification of jobs was a modified D.O.T. coding system. The occupational clusters were grouped matching the state's vocational-technical areas.

A Chi-square test was used to determine if a statistically significant difference existed between the graduate's training and his subsequent employment as measured by the 91 job clusters established by the OTIS project.

The Chi-square of 2.8 was less than the 3.841 value for a 0.05 level of significance. Because the calculated value was smaller than the tabulated Chi-square value, this writer accepted the null hypothesis that there was no difference between the graduate's training and his subsequent employment as measured by the 91 job clusters established by the OTIS project, based on D.O.T. and H.E.W. code classifications.

Employment data used in the OTIS cluster classification system and analyzed in this study is shown in Table XI.



TABLE XI

PUBLIC SCHOOL GRADUATES' EMPLOYMENT BY VOCATIONAL-TECHNICAL AREAS  
AS MEASURED BY OTIS CLUSTER CLASSIFICATION SYSTEM

| Vocational Area      | Number of Respondents | In Cluster | Not in Cluster |                   |
|----------------------|-----------------------|------------|----------------|-------------------|
|                      |                       |            | Related Field  | Not Related Field |
| Agriculture          | 79                    | 0          | 3              | 76                |
| Distributive         | 76                    | 14         | 8              | 54                |
| Health               | 214                   | 201        | 0              | 13                |
| Home Economics       | 131                   | 4          | 0              | 127               |
| Office               | 191                   | 129        | 23             | 39                |
| Technical            | 110                   | 72         | 0              | 38                |
| Trade and Industrial | 320                   | 127        | 64*            | 129               |
| TOTAL                | 1121                  | 547        | 98             | 476               |

\*Includes 39 cosmetologists and eight in programs for which no demand was surveyed; also, 17 in occupations surveyed for which no program exists.

This table indicates a need for restructuring the agriculture and home economics clusters. A new clustering would include the cosmetologists in the trade and industrial vocational area.

Private school data does not include the vocational areas of agriculture, distributive education, health, and home economics. Table XII includes the data for office, technical, and trade and industrial vocational areas.

The extremely low number of students not in cluster indicates a more representative clustering of private school students as shown in Table XII.

TABLE XII

PRIVATE SCHOOL GRADUATES' EMPLOYMENT OF VOCATIONAL-TECHNICAL  
AREAS AS MEASURED BY OTIS CLASSIFICATION SYSTEM

| Vocational           | No. of Respondents | No. In Cluster | No. Out of Cluster | No. in Occupational Area Not In Cluster |
|----------------------|--------------------|----------------|--------------------|---|
| Office               | 344                | 239            | 83                 | 22                                      |
| Technical            | 158                | 109            | 42                 | 7                                       |
| Trade and Industrial | 401                | 272            | 109                | 20                                      |
| TOTAL                | 903                | 620            | 234                | 49                                      |

Question 2: Are there significant differences between the graduate's response to his training employment relationship and those relationships as measured by the job and title clusters utilized in the Occupational Training Information System?

Observation: In an analysis of the graduate's understanding of his job, the question as to how he related his job and training was studied. A Chi-square analysis of the relationship was made. The calculated Chi-square was 6.77 with one degree of freedom and a 0.05 significance at 3.841.

With a larger calculated Chi-square, this writer rejected the null hypothesis that there was no difference between the graduate's perception of the relationship between his training and subsequent job, and the same relationship as measured by job clusters established by the OTIS project.

This finding posed questions which prompted further study, necessitating a more detailed analysis by vocational program areas.

To secure additional information of the graduate's understanding of his job and training relationship, this question was asked: Is there a significant difference between the graduate's response to his training-employment relationship and these relationships as measured by job clusters utilizing D.O.T. and H.E.W. job and program codes? It is assumed there is a difference between the two relationships. To validate this assumption, a Chi-square test was used to determine if a statistically significant difference did exist. The results of this analysis by vocational areas are as follows.

TABLE XIII

CHI-SQUARE ANALYSIS OF AGRICULTURE GRADUATES' RESPONSES  
OF PERCEIVED JOB RELATIONSHIP TO ACTUAL JOB  
RELATIONSHIP MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response | H.E.W.-D.O.T. Code | Total      |
|-------------|------------------|--------------------|------------|
| Related     | 37               | 4                  | 41         |
| Non-Related | 42               | 75                 | 117        |
|             | <u>79</u>        | <u>79</u>          | <u>158</u> |

df = 1

sign. 0.05 = 3.841

Chi-square = 33.5

Observation: With the large calculated Chi-square value, the null hypothesis that there was no difference between the graduate's understanding of the relationship between his training and subsequent job and the same relationship as measured by H.E.W.-D.O.T. codes was rejected at the five per cent level of significance.

TABLE XIV

CHI-SQUARE ANALYSIS OF DISTRIBUTIVE EDUCATION GRADUATES'  
RESPONSES OF PERCEIVED JOB RELATIONSHIP TO ACTUAL  
JOB RELATIONSHIP MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response | H.E.W.-D.O.T. Code | Total |
|-------------|------------------|--------------------|-------|
| Related     | 45               | 22                 | 67    |
| Non-Related | 31               | 54                 | 85    |
| TOTAL       | 76               | 76                 | 152   |

df = 1                      sign. 0.05 = 3.841                      Chi-square = 14.1

Observation: A Chi-square of 14.1 is greater than 3.841 tabulated value at the five per cent level of significance. This indicates that the null hypothesis of no significant difference between the graduate's perception of his job and the actual job taken as measured by job clusters utilizing D.O.T. and H.E.W. job and program codes was rejected.

TABLE XV

CHI-SQUARE ANALYSIS OF HEALTH EDUCATION GRADUATES' RESPONSES  
OF PERCEIVED JOB RELATIONSHIP TO ACTUAL JOB  
RELATIONSHIP MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response | H.E.W.-D.O.T. Code | Total |
|-------------|------------------|--------------------|-------|
| Related     | 205              | 203                | 408   |
| Non-Related | 9                | 11                 | 20    |
| TOTAL       | 214              | 214                | 428   |

df = 1                      sign. 0.05 = 3.841                      Chi-square = 0.20

Observation: In the analysis of health education student responses, a calculated Chi-square of 0.20 was found. With the calculated value smaller than the 3.841 tabulated Chi-square value, the null hypothesis that there was no significance between the student perceived job relationship to his subsequent employment is accepted.

TABLE XVI

CHI-SQUARE ANALYSIS OF HOME ECONOMICS GRADUATES' RESPONSES OF  
PERCEIVED JOB RELATIONSHIP TO ACTUAL JOB RELATIONSHIP  
MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response | H.E.W.-D.O.T. Code | Total |
|-------------|------------------|--------------------|-------|
| Related     | 56               | 1                  | 57    |
| Non-Related | 75               | 130                | 205   |
| TOTAL       | 131              | 131                | 262   |

df = 1

sign. 0.05 = 3.841

Chi-square = 67.8

Observation: With the large calculated Chi-square value, the null hypothesis that there was no significant difference between the graduate's perception of the relationship between his training and subsequent job, as measured by pre-determined job clusters utilizing D.O.T. and H.E.W. job and program codes, was rejected at the five per cent level of significance.

TABLE XVII

CHI-SQUARE ANALYSIS OF OFFICE OF EDUCATION GRADUATES' RESPONSES OF  
PERCEIVED JOB RELATIONSHIP TO ACTUAL JOB RELATIONSHIP  
MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response | H.E.W.-D.O.T. Code | Total |
|-------------|------------------|--------------------|-------|
| Related     | 141              | 152                | 293   |
| Non-Related | 50               | 39                 | 89    |
| TOTAL       | 191              | 191                | 382   |

df = 1                      sign. 0.05 = 3.841                      Chi-square = 1.8

Observation: A Chi-square of 1.8 is less than the 3.841 tabulated value for a five per cent level of significance. Because the calculated value was smaller, this writer accepted the null hypothesis that there was no difference between the graduate's perception of his job and the actual job taken as measured by job clusters utilizing D.O.T. and H.E.W. code classifications.

TABLE XVIII

CHI-SQUARE ANALYSIS OF TECHNICAL EDUCATION GRADUATES' RESPONSES OF  
PERCEIVED JOB RELATIONSHIP TO ACTUAL JOB RELATIONSHIP  
MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response | H.E.W.-D.O.T. Code | Total |
|-------------|------------------|--------------------|-------|
| Related     | 51               | 31                 | 82    |
| Non-Related | 18               | 38                 | 56    |
| TOTAL       | 69               | 69                 | 138   |

df = 1                      sign. 0.05 = 3.841                      Chi-square = 12.0

Observation: With the large calculated Chi-square value, the null hypothesis that there was no significant difference between the graduate's perception of the relationship between his training and job is rejected at the five per cent level of significance.

TABLE XIX

CHI-SQUARE ANALYSIS OF TRADE AND INDUSTRIAL GRADUATES' RESPONSES  
OF PERCEIVED JOB RELATIONSHIP TO ACTUAL JOB RELATIONSHIP  
MEASURED BY H.E.W.-D.O.T. CODE

| Employment  | Student Response   | H.E.W.-D.O.T. Code | Total |
|-------------|--------------------|--------------------|-------|
| Related     | 240                | 256                | 476   |
| Non-Related | 121                | 105                | 246   |
| TOTAL       | 361                | 361                | 722   |
| df = 1      | sign. 0.05 = 3.841 | Chi-square = 1.6   |       |

Observation: In the analysis of the trade and industrial student responses, a calculated small Chi-square of 1.6 would indicate acceptance of the null hypothesis that there was no significant difference between the student's perceived job relationship and his actual job relationship as measured by D.O.T. job codes.

A casual perusal of these related facts and figures may not seem too significant. If it is assumed that a good indication of the effectiveness of vocational-technical programs can be measured by the employment of the graduate in his area of specialization, then some of the public school programs are not achieving the educational objectives of the program.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This concluding chapter is composed of three sections. The first section is devoted to a summary of the concepts utilized in this study. The second section deals with the findings and conclusions related to the research questions proposed in Chapter I. The last section presents recommendations for improving Oklahoma's present manpower system and possible future studies.

#### Summary

Oklahoma is slowly moving from an agricultural state to a more industrialized state. Oklahoma's desire to develop its industry and its human resources has converged attention on the issue of occupational training and manpower supply and demand. Validation of supply-demand data is a must if a true representative picture of existing conditions is to be accomplished. This study is concerned with an empirical validation of the manpower supply and demand matching procedure utilized in the Occupational Training Information System. By focusing on the analysis of jobs, job titles, and their relationship to training programs, an attempt at a more reliable and accurate measure is made of manpower supply and demand.

This study collected detailed information about the State's public and private schools' vocational-technical programs and matched data of



graduates from these programs with Dictionary of Occupational Title job codes and U. S. Office of Education program codes. In this manner, supply (educational) data could be studied and related to their initial employment (demand) data.

### Conclusions

On the basis of this study, the following observations have been made regarding the research questions proposed in this study. This section states each research question and the conclusions based upon the findings.

Question 1: Are graduates of Oklahoma vocational-technical programs securing employment in areas related to training as hypothesized in the 91 job and training title clusters utilized in the Occupational Training Information System.

Observation: There was not a significant difference between the graduate's training and subsequent employment as measured by the 91 job clusters utilized by the OTIS project, based on D.O.T. and H.E.W. code classifications.

Question 2: Are there significant differences between the graduate's response to his training-employment relationship and these relationships as measured by the job and title clusters utilized in the Occupational Training Information System?

Observation: There is a significant difference between the graduate's response of his perceived relatedness of the "education-job" relationship. This observation prompted further study resulting in this question.

Question 2A: Is there a significant difference between the graduate's response to his training-employment relationship and these same relationships as measured by job clusters utilizing D.O.T. and H.E.W. job and program codes?

Observation: The large calculated Chi-square values in the agriculture, distributive education, home economics, and technical education areas indicate there is a significant difference between the graduate's understanding of the relationship between his training and area of employment.

Graduates from specific training programs as opposed to general occupational education training programs were more likely to take employment in a related area.

Question 3: Are the seven traditional program service divisions of agriculture, distributive, health, home economics, office, technical, and trade and industrial education representative of initial employment patterns?

Observation: The seven traditional program service divisions are representative of initial graduate employment patterns except the agriculture and home economics clusters. Figures in Table XI indicate a need for restructuring these clusters.

The extremely low number of students "not in cluster" indicates a more representative clustering of private school students.

There are an exceptionally large number of distributive education graduates securing employment in office education employment areas.

Question 4: Are there significant areas of employment which are not presently included in the hypothesized job and title clusters?

Observation: Oklahoma graduates entered 384 different jobs measured by D.O.T. codes. This indicates the diversity of the graduates' employment. However, there are significant employment areas not included. These are: automotive service station attendant; barber; carpenter helper, cook helper, cosmetologist, dental assistant, dietary aide; groceryman, journeyman; the following laborers: carpentry, construction, pipeline, ranch, stores; parts clerk, automotive; plumber helper; receiving clerk; receptionist; rotary driller, helper; roustabout, II; service unit operator; shipping clerk; stock clerk; telephone operator; tool pusher; truck driver; and welder helper.

Students working full-time were 33 per cent of the total population studied. The largest group, 37 per cent, were those graduates continuing their education on a full-time basis. Of this group, 21 per cent continued their education in the field related to training. An observation of the facts would indicate that in Oklahoma two high school "exits" are being followed by the graduates. One entry into the world of work, the second into continuing education.

A high proliferation of the number of jobs entered by graduates in some vocational areas indicates a lack of preparation in skills for specific jobs. This conclusion can be drawn from the large number of D.O.T. jobs entered by graduates with no major concentration in a few job areas.

## Recommendations

The recommendations section is divided into two different parts; i.e., implications for immediate attention in Oklahoma vocational-technical system and recommendations for further study. Broad implications resulting from this study which could influence vocational-technical programs are:

- (1) Oklahoma must identify employment opportunities and correlate educational curriculum with available employment opportunities. The 384 jobs entered by graduates should be reduced to the following 19 job clusters for educational and employment classification purposes: accounting, agriculture, clerical, communications, construction, domestic and custodial, electrical, food service, graphic arts, health, marketing, managerial, mechanical and repair, metals, secretarial, social services, textiles, transportation, and wood products.
- (2) If student needs are to be met, Oklahoma must provide two vocational-technical programs. One to provide a "salable skill" for immediate employment after high school and a second program for those continuing their education. More innovative programs with broader applicability to a wide spectrum of job titles must be developed.
- (3) Curriculum must be relevant and provide meaningful experiences as technological advancement eliminates occupational categories.

Technological advances will require an integrated program of occupational education. The integrated program should focus on the "commonalities of occupations" and differential aspects of vocational subjects. Teachers in the fields of agriculture, business, health, home economics, industrial programs, and guidance should present a correlated, integrated program that provides occupational information, guidance activities, and experiences that lead to preparation in a specific occupational cluster. Integrative programs attempt to eliminate unnecessary duplication in instructional content, draw on natural relationships, and correlate subject matter. Within this framework education becomes a unifying experience rather than a random assemblage of unrelated and self-contained courses. In Oklahoma, a mix of program service area courses already exists by virtue of agriculture and home economics teaching courses which by H.E.W. classification are related to trade and industrial education. An integrative program would focus on recommendations (4) and (5).

- (4) Curricula must provide exploratory experiences in the area of business, health, and industry with the development of marketable skills in one broad area or "job cluster".
- (5) Job clusters could be further divided into "job nodules" covering specific skills or specific activities

permitting the student to acquire basic "salable" skills.

- (6) Industry, educators, and curriculum planners must identify educational requirements common to industry, formulate on-the-job performance objectives, determine student competence, and select course content to reach performance objectives.
- (7) Education must provide employable people for available job opportunities.
- (8) Education must improve educational standards through program enrichment and more relevant public school vocational-technical programs.
- (9) Educators and administrators must recognize educational and employment problems and establish a continuing program of vocational-technical courses integrating the applied sciences and engineering in order to improve the standards of the educational system and to qualify students for employment in jobs available in the community or out of the community. Ideally, courses should be designed for existing jobs.
- (10) Legislative changes must be considered. For example, some states are considering legislation which would require all automotive maintenance mechanics to be licensed. Mechanics' jobs have been classified into twelve job clusters for licensing. These clusters

would provide guides for curriculum planning and job classification.

#### Recommendations for Further Study

This study proliferates into many suggestive areas of investigative study effecting graduates and their employment patterns. Several questions arise as to the ability of vocational-technical programs to meet the students' needs as well as industrial needs.

It is, therefore, recommended that further study be made regarding these subjective areas:

- (1) Classification and standardization of vocational-technical programs using the U. S. Office of Education codes as a guide.
- (2) Make investigative studies into the "commonalities" of the job clusters and the establishment of "job nodules" for training in specific skills.
- (3) Investigate vocational programs and relate to spending as to program effectiveness; thus, establish the need for concerted, clear-cut policies to determine program and spending priorities.
- (4) Design a program aimed at balancing manpower supply with anticipated demand. A goal should be a consistent, continuing study with industry providing data on existing needs as well as anticipated skill requirements in five or ten years.
- (5) Implementation of a program for a yearly "follow-up" study such as this to validate "supply" and "demand"

data. Data secured would be used for "short-term" and "long-term" educational program projection and planning.

- (6) Determine and assess the value of a center for research and study of emerging occupations in Oklahoma. This center would establish educational priorities with specific educational-industry objectives in order of importance. It would relate industrial objectives to educational practices in the schools and give direction to curriculum planning.
- (7) An indepth study of the commingling of individual D.O.T. classified jobs should be made and related to vocational manpower supply and demand data. For example:  
DOT812.884 welder - where were they trained; where were they employed; what was the demand? A statistical analysis with established trend projections would be a valuable asset in establishing manpower supply and demand requirements.

The most serious impediments to educational progress are resistance to change. Changes present problems; problems require answers; answers require decisions. The ability to make the right decisions is the key to the success of educational programs in a changing, technically-oriented society. Education must recognize new ideas, new methods, and new programs; plus, develop a systematic approach for implementation of new programs to meet changing manpower requirements. Valid manpower supply and demand data is the first requirement in establishing educational program needs and objectives.



#### SELECTED BIBLIOGRAPHY

- (1) United States Department of Health, Education, and Welfare. Vocational Education and Occupations. Washington: Government Printing Press, 1969.
- (2) United States Department of Labor. Dictionary of Occupational Titles. Washington: Government Printing Press, 1965.
- (3) U. S. Congress, Senate. Vocational Education Act of 1963. Public Law 82-210, 88th Congress, 1st Session, S.I.
- (4) U. S. Congress, House of Representatives. Vocational Education Amendments of 1968, Public Law 90-576, 90th Congress, 2nd Session.
- (5) Mudzo, Michael G. "The Development of a Decision Model for State-wide Manpower Planning Related to Vocational and Technical Education." (Unpublished doctoral dissertation, Oklahoma State University, Stillwater, 1970.)
- (6) Roney, Maurice W., and Paul V. Braden. Occupational Education Beyond the High School in Oklahoma. Stillwater, Oklahoma: Research Foundation, Oklahoma State University, 1968.
- (7) Cooper, Russell M. et al. "The Educational Program." Review of Educational Research, XXX, No. 4 (October, 1960).
- (8) Roney, Maurice W. Occupational Criteria and Preparatory Curriculum Patterns in Technical Education Programs. United States Department of Health, Education, and Welfare, Office of Education, Bulletin OE-80015, Washington: Government Printing Office, 1960.
- (9) Larson, Milton E. Review and Synthesis of Research in Technical Education. Columbus: The Center of Research and Leadership Development in Vocational-Technical Education, The Ohio State University, 1966.
- (10) Graney, Maurice. The Technical Institute. New York: The Center for Applied Research in Education, 1964.
- (11) Phillips, Donald S. Personal and Social Background Characteristics of Entering Technicians Education Students at Four Post-High School Institutions. Stillwater, Oklahoma: Research Foundation, Oklahoma State University, January, 1968.

- (12) Sherrell, Eugene G. "Factors Affecting Interstate Mobility of Technicians Graduating from Oklahoma Schools." (Unpublished doctoral dissertation, Oklahoma State University, Stillwater, 1969.)
- (13) Paul, Krishan K. "An Assessment of the Oklahoma Private School Occupational Training Programs With Implications for State-wide Planning." (Unpublished masters thesis, Oklahoma State University, Stillwater, 1970.)
- (14) Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart, and Winston, Inc., 1966.
- (15) Profiles of Excellence, National Education Association of the United States, Office of Professional Development and Welfare, Washington, D. C., 1966.
- (16) United States Department of Health, Education, and Welfare. Standard Terminology for Curriculum and Instruction in Local and State School Systems. Pub. OE-23052, Washington: Government Printing Office, 1969.
- (17) Buchanan, Hal N. Report of Activities and Services, University Placement Services, Stillwater: Oklahoma State University, 1969.
- (18) Oklahoma Employment Security Commission. Manpower in Oklahoma. Oklahoma City: Oklahoma Employment Security Commission, December, 1969.
- (19) Briggs, Lloyd L. A Study of the Graduates from Oklahoma's Post High School Programs of Technical Education. Stillwater, Oklahoma: State Board for Vocational Education, 1965.
- (20) Sharp, Laure M., and Rebecca Kreasnegor. The Use of Follow-Up Studies in the Evaluation of Vocational Education. Washington: Bureau of Social Science Research, Inc., 1966.
- (21) United States Bureau of Labor Statistics. Technician Manpower; Requirements, Resources, and Training Needs. Bulletin Vol. 1512, Washington: Government Printing Office, June, 1966.
- (22) Roney, Maurice W., and Paul V. Braden. Occupational Education Beyond the High School. Norman, Oklahoma: Center for Economic Development, State of Oklahoma, 1967.
- (23) United States Department of Labor. Manpower Report of the President and A Report of Manpower Requirements, Resources, Utilization and Training. Washington: Government Printing Office, 1968.

- (24) Engineering Manpower Commission. Trends in Engineering Technician Enrollments and Graduates. New York: Engineers Manpower Commission, Engineers Joint Council, July, 1967.
- (25) Dickinson, Carl, and Betty Newbrigin. "The Occupations They Are Choosing." Journal of College Placement (February, 1968).
- (26) United States Department of Health, Education, and Welfare. Education and Training. Washington: Government Printing Press, 1969.
- (27) Somers, Gerald G. "The Response of Vocational Education to Labor Market Changes." The Journal of Human Resources, Supplement, III (April, 1968).
- (28) Krich, Percy. "Education-Servant of Industry." School and Society (Summer, 1969).
- (29) Braden, Paul V., James L. Harris, and Krishan K. Paul. Manpower Requirements and Occupational Programs in Oklahoma. Stillwater: Oklahoma State University, 1969.
- (30) Braden, Paul V., James L. Harris, and Krishan K. Paul. Occupational Training Information System, Cycle Two Report -- A Second Yearly Report Complete With System Documentation. Stillwater: Oklahoma State University, 1970.
- (31) Jakubauskas, E. B. Coordination in Obtaining and Utilizing Manpower Data for Vocational-Technical Education Planning. Prepared for Summer Research Institute on Manpower Surveys for Vocational-Technical Education Planning. Storrs, Connecticut: University of Connecticut, July, 1968.
- (32) Malinski, J. F. "Minnesota Implements the Regional Concept in a State Committed to PPBS." American Vocational Journal, Vol. 44, No. 8 (November, 1969).
- (33) Morton, L. M. "The State Advisory Council: Potential Powerhouse." American Vocational Journal, Vol. 44, No. 8 (November, 1969).
- (34) Starr, H. Methodologies for Conducting State Program Evaluation. Columbus, Ohio: The Center for Vocational and Technical Education. A paper presented at the National Conference on Methods and Strategies for State Plan Development, March, 1969.
- (35) Arnold, W. M. Vocational Technical and Continuing Education in Pennsylvania. A Report to the Pennsylvania State Board of Education, 1969.
- (36) Fasold, J. V. Guide to Structure and Articulation of Occupational Education Programs. Salem, Oregon: State Department of Education, 1969.

- (37) Venn, Grant. Man, Education, and Work. Washington: American Council on Education, 1966.
- (38) Michael, D. N. Cybernation: The Silent Conquest. Santa Barbara, California: Center for the Study of Democratic Institutions, 1962.
- (39) Emerson, L. A. Education for a Changing World of Work, Appendix I, Technical Training in the United States. Office of Education, United States Department of Health, Education and Welfare. Washington: U. S. Government Printing Office, 1963.

APPENDIX

FOLLOW-UP QUESTIONNAIRE

- I. DID YOU COMPLETE THE OCCUPATIONAL PROGRAM IN WHICH YOU WERE ENROLLED? (CIRCLE ONE) 1. YES 2.  NO
- II. EMPLOYMENT STATUS (CIRCLE ONE ONLY)
1. WORKING FULL TIME IN OCCUPATION FOR WHICH YOU WERE TRAINED IN THE OCCUPATIONAL TRAINING PROGRAM.
  2. WORKING FULL TIME IN OCCUPATION RELATED TO TRAINING RECEIVED.
  3. WORKING FULL TIME IN OCCUPATION NOT RELATED TO TRAINING RECEIVED.
  4. CONTINUING FULL TIME IN SCHOOL IN FIELD RELATED TO TRAINING.
  5. CONTINUING FULL TIME IN SCHOOL IN FIELD NOT RELATED TO TRAINING.
  6. ARMED SERVICES.
  7. EMPLOYED PART TIME, BUT NOT ATTENDING SCHOOL.
  8. UNEMPLOYED, SEEKING EMPLOYMENT.
  9. UNEMPLOYED, NOT SEEKING EMPLOYMENT.
- III. IF EMPLOYED:
- (a) WHAT IS YOUR JOB TITLE? TERMINAL MOR.  
(Examples: Nurses Aid, Electronics Technician, etc.)
- (b) LOCATION OF JOB: FT. SMITH ARK. 72901  
(City) (State) (Zip Code)
- IV. IF EMPLOYED WHAT IS YOUR YEARLY SALARY RANGE? (CIRCLE ONE)
1. UNDER \$3,000
  2. \$3,001 - 4,000
  3. \$4,001 - 5,000
  4. \$5,001 - 6,000
  5. \$6,001 - 7,000
  6. OVER \$7,000
- V. HOW WOULD YOU RATE YOUR OCCUPATIONAL PROGRAM IN TERMS OF EMPLOYMENT BENEFITS TO YOU? (CIRCLE ONE)
1. HIGH
  2. AVERAGE
  3. LOW
  4. NOT APPLICABLE
- № 19972**

DETACH AND MAIL THIS CARD

OCCUPATIONAL TRAINING INFORMATION SYSTEM  
IN CO-OPERATION WITH  
STATE DEPARTMENT OF VOCATIONAL-  
TECHNICAL EDUCATION, AND ASSOCIATION  
OF PRIVATE SCHOOLS  
401 CLASSROOM BUILDING  
STILLWATER, OKLAHOMA 74074

JOHNSON HAROLD P  
108 EASTLAND DRIVE

0019972

PLEASE FORWARD PROMPTLY

VITA

Lonnie A. Holmes

Candidate for the Degree of

Doctor of Education

Thesis: AN EMPIRICAL VALIDATION OF VOCATIONAL AND TECHNICAL EDUCATION GRADUATES' INITIAL EMPLOYMENT PATTERNS

Major Field: Higher Education

Biographical:

Personal Data: Born in Vian, Oklahoma, March 10, 1925, the son of Mr. and Mrs. Lonnie Albert Holmes.

Education: Graduated from Gore High School, Gore, Oklahoma, in May 1942; received the Bachelor of Science degree from Oklahoma State University in January 1950, with a major in Industrial Engineering; received a Master of Business Administration degree from the University of Tulsa in June, 1961; completed requirements for the Doctor of Education degree at Oklahoma State University in May 1971.

Professional Experience: Service Training Representative and Administrative Assistant, Detroit Diesel Engine Division, General Motors Corporation, Detroit, Michigan, 1950-1955; In-plant training supervisor and Personnel Testing Administrator, Walter O'Bannon Company, Tulsa, Oklahoma, 1956-1962; Advisor and Teacher Trainer, Ford Foundation-Oklahoma State University Pakistan Project, Government Polytechnic Institute, Rawalpindi, West Pakistan, 1963-1965; Assistant Professor and Head of Mechanical Technology, Oklahoma State University, Stillwater, Oklahoma, 1965-1970; Professor of Mechanical Technology, Metropolitan State College, Denver, Colorado, effective September, 1970.

Professional Organizations: Phi Delta Kappa