ABSTRACT

A SURVEY OF BUSINESS AND INDUSTRY NEEDS
FOR VOCATIONAL-TECHNICAL PROGRAMS IN
THE JASPER COUNTY JUNIOR COLLEGE

by Harlan L. Heglar

The need for this study has evolved from the changing American occupational scene which in turn has resulted in the need for more occupational training at a higher level. It is in the interest of the general welfare of the American people to see that as many persons as possible are given an opportunity to earn a socially acceptable living.

The purpose of this study was to obtain selected occupational data and employer opinions concerning vocational-technical occupations in the Jasper County Junior College business and industry service area for which occupational training could be implemented at the community college level, and more specifically at the Jasper County Junior College. From this information broad program recommendations were made.

The data upon which this study was based were obtained from a questionnaire mailed to selected employers in the Jasper County Junior College business and industry service area. These employers were selected on the basis of having a total of five or more employees except that certain businesses (physicians, attorneys, accountants, dentists, and optometrists) were included regardless of size, and certain businesses (taverns, bars, barber and beauty shops, and farms) were excluded regardless of size. Specific information obtained from these employers included the total number of employees, the number of employees in selected occupations, the number of trainees, and the number of replacements for each occupation during 1964. General information concerning the employing firms as well as employer comments concerning the occupations reported were also obtained.

Questionnaire returns produced a total of 14,430 employees or 79.7 percent of the estimated total employees covered by the survey. Three thousand and eighty-two, or 21.4 percent of these positions were listed by employers as having post-high school educational requirements below a baccalaureate degree. Of this total of 3,082 employees,

2,069 were men and 1,013 were women. During 1964 the firms had an additional 316 persons being trained for replacements in these occupations. They also reported an annual replacement figure of 445 persons.

Information received on the 3,082 skilled, semi-professional, and technical workers showed 1,156 to be in Industrial type occupations, 1,560 in Business type occupations, 297 in Health type occupations, with the remaining few being in Agricultural Service and Public Service occupations.

The reported occupations were placed in twenty-four groups, based on similar basic educational requirements. These twenty-four occupational groups were ranked from highest to lowest on: 1) number of employees, 2) number of replacements, and 3) number of replacements needed in excess of trainees available within the firms. The following groups ranked in the upper one-fourth in all three factors:

1. Accountants, business management, outside salesmen (except agriculture), real estate, insurance, finance, retail management and buying, and sales manager.
2. General secretary, general office, and legal secretary.

In addition, the following groups ranked in the upper one-fourth in two of the three factors:

1. Automotive technician.
2. Foreman--first line supervisor.
3. Architectural draftsman, civil and highway technicians, and engineering aide.
4. Machine design draftsman, drafting and design technician, metallurgical technician, mechanical technician, quality control technician, and industrial X-ray technician.
5. Nurses aide, and practical nurse.

A majority of the respondents indicated a local shortage of trained persons in all of the occupational categories grouped above except the group including general secretary, general office, and legal secretary, where a majority indicated an adequate supply.

Over 90 percent of the responses indicated the Jasper County Junior College could be of "some help" or "very valuable" help to them in meeting their need for new employees if occupational training programs were established in the college curriculum to prepare prospective employees in areas of greatest need.

Conclusions drawn from the review of literature and the findings of the study include:

1. Societal and technological changes have a bearing on the proper kind and level of vocational-technical education needed to be made available for youth and adults in the Jasper County Junior College service area.

2. Business and industry provide wide employment in the skilled, semi-professional, and technical occupations in the college business and industry service area.

3. There is a concern on the part of employers concerning the lack of trained employees.

4. The educational level or amount of training for a particular occupation may vary among employers.

5. A majority of the employers are willing to cooperate with the college to implement and operate vocational-technical programs.

6. Based on the responses from employers, present vocational programs in the Jasper County Junior College need to be strengthened and a number of new programs should be added to the curriculum.

A SURVEY OF BUSINESS AND INDUSTRY NEEDS FOR VOCATIONAL-TECHNICAL PROGRAMS IN THE JASPER COUNTY JUNIOR COLLEGE

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CHAPTER I

THE PROBLEM

Introduction

The nature of work in America has shifted considerably over the past twenty years. These changes have required more occupational training at a higher level. In the generation ahead the American people can be assured that most jobs are going to require still more highly skilled, better trained, and better educated persons than at present or in the past. We have long passed the time when most skills were passed on from father to son without a formal type of education. Today business, industry, and educational institutions provide most of the vocational training that is required for entering, up-grading, or retraining a person in an occupation. Occupational training by all of these institutions is going to increase in the future. A high degree of skill is now required in both agriculture and industry and the future belongs to those individuals who are equipped with these skills to begin

with, who are willing to advance in these skills, and who will add new skills. Even industries which have been slow to change in the past are finding it necessary to consider changes for the future.

It is in the interest of the "general welfare" of the American people to see that as many persons as possible are given an opportunity to earn a socially acceptable living. Barlow, in the National Society for the Study of Education Yearbook of 1965 indicated that new and improved programs of vocational education can be justified on: a) the right of each individual to a total education, b) the responsibility of society (through the public education system) to provide such instruction, and c) the effect of vocational education on the economic strength of the nation.[1]

Statement of Purpose

The purpose of this study is to make broad recommendations to the Jasper County Junior College staff in the

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[1]Melvin L. Barlow, "The Challenge to Vocational Education," Chapter I in the Sixty-fourth Yearbook of the National Society for the Study of Education, Part I Vocational Education (Chicago: University of Chicago Press, 1965), p. 2.

areas of need for occupational training programs at the post-high school level in the College's business and industry service area based on primary occupational information obtained through employers and by employer opinions concerning these occupations.

The study is basically quantitative in that it is directed at an occupational count of persons within those occupations which, according to employers, require as preparation a post-high school education but below the level of a baccalaureate degree.

Specifically the purposes are:

1. To obtain from employers, information about each of the occupations including--

    a. Number of employees,

    b. Number of persons being trained by business and industry during 1964,

    c. Number of replacements required during 1964,

    d. Past (1960-1965) and future (1965-1970) employment trends,

    e. Opinions of representatives of business and industry relative to obtaining new employees from the vocational-technical programs of the Jasper County Junior College, and

    f. Potential vocational-technical advisory committee support the college might receive from business and industry.

2. To make broad curriculum recommendations based on the information obtained from the employers.

Rationale

A comprehensive community college should provide an up-to-date and adequate curriculum for the people of its community. It will be shown as part of this study that vocational-technical education is an important part of that curriculum. Also much data will be presented relating to employment trends, population trends, economic conditions, and industrial characteristics, which help establish the need for updating and providing adequate vocational-technical programs in the Jasper County Junior College. This information was obtained from secondary sources.

These secondary data are important for planning curriculums, but they are not the sole source. Primary data must also be obtained and utilized.

The local vocational-technical administrator must harmonize the secondary data with primary data showing local vocational-technical needs. Primary data includes: 1) occupations and families of occupations in which employment opportunities exist, 2) occupational trends, 3) the number

of employees being trained within business and industry, 4) the number of employee replacements necessary, 5) the employer's opinion as to the availability of trained employees, and 6) the support from employers for training programs.

The source of primary data is the local community. This study, then, as pointed out in the statement of purposes, is an attempt to obtain this primary information and from it make recommendations about occupational areas in which vocational-technical programs are needed for the Jasper County Junior College business and industry service area.

Definition of Terms Used

Vocational and Occupational Education

These terms in their broadest sense encompass collegiate level instruction leading to the professions, as well as occupational training which requires less than college level instruction. This study is focused on that part of vocational or occupational education which provides occupational competencies normally offered by the comprehensive community college.

Vocational-technical

This term is used here to include the community college curriculum which prepares, retrains, or upgrades individuals in a broad range of skilled, technical, and semiprofessional occupations. Generally two years of study are required to receive a degree in vocational-technical programs. However many non-degree programs are offered for upgrading and retraining persons and these may vary considerably as to length of training time. We may refer here to the vocational-technical department of the community college, to the vocational-technical programs offered, or to vocational-technical occupations which include supervisory positions, sales positions, and others which the employers desire to be filled with persons having a post-high school educational background. The occupations listed on the study questionnaire fall into this vocational-technical category.

Semi-professional

This term often refers to college-level education organized into curriculums which lead to an associate degree, and which are designed to prepare the student for entry into employment in one of several career fields recognized as approaching professional status. Examples of occupations

which are often considered semi-professional are: registered nurse, private secretary, architectural draftsman, medical technician, accountant, and engineering technician.

Technical Education

This term refers to one kind of semi-professional education. It is carried out at the college level, and 1) emphasizes work in mathematics and science and frequently, but not always, relates to engineering, 2) gives much attention to specialized technical content, but also stresses skill in the use of tools and instruments, and 3) leads to occupational competence in the chosen field of specialization. In the minds of many employers and others, the terms "technical education" and "semi-professional education" are used interchangeably. No distinction between the two is necessary for this study.

Families or Groups of Occupations

There is a tendency on the part of the community colleges to avoid extreme specialization and to regard the vast spectrum of jobs in their vocational-technical offerings. Occupations for which much of the basic training is similar may be classed as families or groups of occupations.

It is often advantageous or necessary for a community college to consider occupations in this manner so that a combination of the factors of sufficient students, employment opportunities, and finances are available to justify the establishment of a curriculum to meet the educational requirements of occupations.

Community College

Generally the community college is a two-year educational institution designed to meet the post-high school educational needs of its local community but not offering a baccalaureate degree. Some of the curriculums may vary in length up or down from the two year requirements. Such programs are often culminated with the presentation of a certificate to the student. The regular two year programs usually result in an associate degree for the student.

Jasper County Junior College, the institution being considered in this study, belongs in the category of a community college. Although the name "junior" is part of the legal name of the college, it is for all intensive purposes a community college and is considered as such in this study.

Jasper County Junior College

The Jasper County Junior College is a two year community college offering transfer and terminal education programs. The College is located in Joplin, Missouri, and has been in existence since 1937. Up to 1964 it was under the jurisdiction of the Joplin school district and was called Joplin Junior College. In 1964 the Jasper County Junior College District was formed and the name of the college changed to Jasper County Junior College.

The total enrollment, full and part-time, as of October 1964 was 1,603. During that same year there were thirty-six full-time and two part-time faculty members.

Shortly after the data for this study was obtained, the college name was again changed, this time to Missouri Southern College. However, since all data was gathered under the name of Jasper County Junior College, this name will continue to be used throughout the study.

Jasper County Junior College District

The geographical area for taxing purposes of the Jasper County Junior College is called the Jasper County Junior College District. The district consists of all of Jasper County plus a few small parts of school districts

that extend outside the county. Due to the fact that the district closely coincides with Jasper County, most of the statistical data used in this study relates only to this county. An attempt to gather corresponding data for the small areas within the district but outside Jasper County was thought to be of little consequence to the findings and recommendations of the study, and would have involved considerable time and expense in obtaining the information.

Jasper County Junior College Business and Industry Service Area

Although the business and industry service area of the Jasper County Junior College is comprised mainly of the legal college district, the College has worked closely with several businesses outside, but close to the legal district. Therefore, the College business and industry service area is slightly larger than the legal boundaries of the district. It should be noted that the business and industry service area used for this study does not include all the cities, counties, etc. from which the college students originate. It does, though, include approximately 90% of them.

Limitations and Scope of the Study

The factors of time, finance, and feasibility have necessitated limitations to this study. The study:

1. Concerns the training needs which might be met by a survey of business and industry. The study does not consider all the factors necessary in the consideration of establishing vocational-technical curriculums at the community college level. For example, this study does not consider facilities, financing, or staffing of programs.

2. Involves the collection of data within the Jasper County Junior College service area. Since the questionnaire was specifically designed and terms defined to meet the needs of this area it would probably need modification for use in another geographical area.

3. Provides information as to the occupational groups in which instruction may be offered, but no attempt is made to provide information that could be used for specific course content in any curriculum.

4. Is limited to post-high school vocational-technical occupations as determined by the employers answering the questionnaire.

5. Is limited to the areas of training which could be most effectively provided by a community college, specifically the Jasper County Junior College. For example, it was decided to eliminate any study of the number or need for barbers or beauticians in the service area because the college advisory committee believed that such occupations were being well provided for through private schools in the area. Farms, as businesses, were also eliminated as it was believed that farming occupations should be another study.

6. Is limited to businesses which have five or more employees except for certain selected classifications.

Overview of the Study

The Jasper County Junior College, a comprehensive community college, is in a logical position to serve, and is obligated to provide, its service area with vocational-

technical programs. In order for the faculty and administration of the college to provide these programs, information is required from many sources.

This study is a survey of business and industry within the Jasper County Junior College business and industry service area to obtain primary information concerning selected occupations common to the area. The importance of the study lies in its value for program development within the college.

This survey identifies the occupations in which employers desire or require employees to have some type of post-high school education, but below the level of a baccalaureate degree. Furthermore, it obtains the opinions of the employers concerning selected factors about these occupations. From this information groups or families of occupations are recommended as a primary step in the implmentation and extension of vocational-technical programs in the Jasper County Junior College.

CHAPTER II

TECHNOLOGICAL AND SOCIETAL CHANGES IN THE UNITED STATES AND THEIR EFFECTS ON THE COMMUNITY AND VOCATIONAL-TECHNICAL EDUCATION

Introduction

The changes that have come about in technology and society in the past forty years have had and will continue to have a major effect on vocational-technical education. The old patterns are proving to be inadequate. Changes of emphasis in methods and subject matter are being made in an effort to keep vocational-technical education in a position which allows adequate preparation of today's youth to fit today's technological fields of employment.

Changes in Technology and Society

The explosion of scientific and technical knowledge has come about because of what Arnstein calls "modern man's

invention of invention, the systematic quest for new ways of doing things, for new products and ideas."[1] This has caused business, industry, and government to invest huge sums of money in Research and Development (R and D). Galton illustrated the trend by indicating that during the first 150 years as a nation the United States--government and industry --spent $18 billion for R & D. From 1950 to 1955 another $18 billion was spent, and during the fiscal year 1962 almost $18 billion.[2] These figures are presented to illustrate the vast increase in importance of R & D. At this rate of increase we may expect the expenditure to double or triple in the next ten to twenty years.

The benefit to man of R & D can be observed in every day life. We have a continuous rise in our standard of living from these "inventions" of modern man. Agricultural products have been improved and increased. Business procedures have progressed to a state of sophistication where

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[1]George Arnstein, "The Technological Context of Vocational Education," Chapter III in the Sixty-Fourth Yearbook of the National Society for the Study of Education, Part I Vocational Education (Chicago: University of Chicago Press, 1965), p. 40.

[2]Lawrence Galton, "Will Space Research Pay Off on Earth," New York Times Magazine, May 26, 1963, p. 29.

computors are solving complex problems once considered impossible. Fewer man hours are required to do the same job than were required 15 to 20 years ago. The New York Times illustrates the technological changes with these observations:

> In 1947, to produce 1,000 tons of steel, it took 14,700 man-hours; in 1962, it took only 10,900 man-hours.
>
> In 1947, to produce a typical automobile, we needed 310.5 man-hours; in 1962, the total came to just half, or 153.0 man-hours.
>
> In 1947, some 340 man-hours were needed to produce 1,000 bushels of wheat, by 1962, this was reduced to 120 man-hours.[3]

Not only do we note a decrease in the number of man-hours of labor needed to produce many products, but a similar decrease is seen in the number of working hours required of the average American in order to buy these products. The net result has been a higher standard of living for the average American.

These technological changes bring an alarming sophistication and complexity to our country's occupations at a time when trends in the American labor force show that by

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[3]John D. Pomfret, "Technological Change Has Played A Major Role in Recent Strikes," New York Times, July 14, 1963, p. E3.

1970 it will total over 100 million people. Eighty-seven million of these will be employed full-time. Of this 87 million people working full-time, 58 million are working now, 26 million will be young workers entering the labor force during this decade, and 3 million will be women entering or re-entering the labor force. New methods, materials, and opportunities along with automation and economic change will necessitate the training and retraining of many non-professional persons.[4]

This growth of the labor force will amount to an approximate 21 percent increase from 1960-1970 but this increase will not be uniform among various occupational groups. Professional, semi-professional, and technical workers will as a group increase 43 percent; manager, officials, and proprietors by 21 percent; clerical workers by 31 percent; sales workers 23 percent; employment in the service occupations will increase 34 percent; but the unskilled workers will show no increase at all. Farmers and farm workers as a group will actually decline by about 22 percent. Table 1 illustrates this prediction.

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[4]Report of the Panel of Consultants on Vocational Education, Education for A Changing World of Work (Washington: U. S. Government Printing Office, 1964), p. xv.

TABLE 1

EMPLOYMENT IN THE UNITED STATES BY MAJOR OCCUPATIONAL GROUP, 1960 to 1976

Major Occupational Group	Actual, 1960		Projected, 1970		Projected, 1976		Percent Change		
	Number (in millions)	Percent	Number (in millions)	Percent	Number (in millions)	Per cent	1960-70	1970-75	1960-75
Total.....	66.7	100.0	80.5	100.0	87.6	100.0	21	9	31
Professional, technical, and kindred workers....	7.5	11.2	10.7	13.3	12.4	14.2	43	16	65
Managers, officials, and proprietors, except farm.....	7.1	10.6	8.6	10.7	9.4	10.7	21	9	32
Clerical and kindred workers.....	9.8	14.7	12.8	15.9	14.2	16.2	31	11	45
Sales workers.....	4.4	6.6	5.4	6.7	5.9	6.7	23	9	34
Craftsmen, foremen, and kindred workers.....	8.6	12.8	10.3	12.8	11.2	12.8	20	9	30
Operatives and kindred workers.....	12.0	18.0	13.6	16.9	14.2	16.3	13	4	18
Service workers.....	8.3	12.5	11.1	13.8	12.5	14.3	34	13	51
Laborers, except farm and mine.....	3.7	5.5	3.7	4.6	3.7	4.3	--	--	--
Farmers, farm managers, laborers, and foremen..	5.4	8.1	4.2	5.3	3.9	4.5	-22	-7	-28

Source: U. S. Department of Labor, Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training (Washington, D. C.: U. S. Government Printing Office), p. 100.

Table 1 also projects the growth of the labor force to the year 1975. It should be noted that the rate of the change will decline after 1970. When viewing the change between 1960 and 1975 there will still be a drastic increase in certain occupations. The largest increase is expected to remain in the professional and technical group which will increase 65 percent; next, is the service workers' group which will increase 51 percent; clerical workers also show a significant increase while unskilled laborers and the farming occupations will stay the same or decrease, but at a slower rate than between 1960 and 1970.

The common fear that "machines will replace man" is unjustified. Machines are inanimate objects and are simply the tools available to man to use. Any technology includes the human element. An increase in the use of machines for business and industry may create a shift in job patterns and an increase in the level of education necessary to hold the job, but not an elimination of man as a worker.

The technological impact has been so great that in 1961 a panel of consultants was appointed by the Secretary of Health, Education and Welfare to review the current National Vocation Education Acts and make recommendations concerning vocational education at all levels.

The panel studied vocational education at both the high school and post-high school levels. Concerning post-high school training the following statement is found in the summary of the report.

> Post-high school technical training is an especially critical need, the Panel found. Estimates of the number of new technicians needed in every year of the present decade range from 67,800 to 200,000. Technician training is presently offered under a variety of auspices, public and private, with the federally reimbursed programs authorized for title VIII of the National Defense Education Act producing a major share of the graduates.[5]

Harris provides a summary of these and other societal and technological trends which demand that higher education seek new directions. His statements were intended to give impetus to the development of the community-junior college in America. These trends are:

- The increasing complexity of everyday life in an urban, industrialized society.
- The explosion of technical and scientific knowledge which has characterized the past four decades.
- The alarming increase in sophistication and complexity of occupations at all levels.
- The fact that in our society education stands between man and his job--that lack of education is a barrier between men and jobs.
- The virtual disappearance of unskilled (common labor) jobs.

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[5] Ibid., p. xvii.

- The impact of automation and the flow process industries on production, on jobs, and on people.
- The action and reaction within a free society which leaves no person content "to stay in his place."
- The realization that knowledge is the key to a better life--not just for the few, but for the many.
- An awareness of the fact that if "only the educated are free," then all free must be educated to the maximum of their capabilities.
- The needs of industry and business for semi-professional (middle level) manpower.
- A manpower shortage in professional, semi-professional, and technical categories; contrasted with devastating unemployment in the unskilled and semi-skilled categories.
- The realization that a "disaster gap" is opening up between those of our citizens with advanced education and those with little education.
- The urgent need for millions of citizens who can both think and do--and the gradual disappearance of a bi-polar society in which an elite few did all of the thinking, and the rest did all the work.[6]

Technological and Societal Changes As They Affect the Community

Communities are becoming increasingly alarmed over the problems of job placement of youth. These concerns

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[6]Norman G. Harris, Technical Education in the Junior College/ New Programs for New Jobs (Washington: The American Association of Junior Colleges, 1964), p. 20.

result from the changing industrial scene, the changing structure of the labor market, and the changing values within the community itself. If the youth can be absorbed into an expanding economy capable of absorbing them, then there is no problem in their training, but when the labor market requires particular skills, vocational training, occupational guidance, and organized placement, then there are community problems.[7]

A worker's participation in the occupational world is much more successful and satisfying to himself and his community when he has been adequately prepared to enter the occupation. Since the occupational world or job market is vast and includes almost all conceivable types of training, his problems of obtaining skills may be extremely complex. Brookover and Nosow recognize this same problem when they say:

> If the allocation of jobs in our society were indeed rational, guided by an "unseen hand"; in a self-equilibrating market, we might have few problems concerning youth and their placement in the world of work. But job distribution

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[7]Wilbur B. Brookover and Sigmund Nosow, "A Sociological Analysis of Vocational Education in the United States," in Education for a Changing World of Work, Appendix III (Washington: U. S. Gov't. Printing Office, 1963), p. 24.

> and the allocation of occupational roles is hardly a rational process. Not every available or necessary job is filled merely on request, or by pushing a button leading to an employment service.[8]

Vocational education has historically been concerned with individuals of all ages but the young worker has had a greater difficulty in finding and holding a job than has the experienced worker.[9] Several factors contribute to this difficulty. Some of these are immaturity, age limits for certain jobs, experience, lack of identification with an industry, company shopping around for jobs and job changing, and lack of seniority; but the single most important reason for the failure of youth in getting a job is their lack of salable skills. They may desire to work hard, but this no longer guarantees success unless a specific skill accompanies this desire or willingness.[10]

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[8] Ibid., p. 22.

[9] U. S. Dept. of Labor, Bureau of Statistics, Labor Force, Employment, and Unemployment Statistics, 1947-61 (Washington: U. S. Government Printing Office, 1962), Table 12, p. 13.

[10] Norman C. Harris, "Community College Technical Education," North Central Association Quarterly (Menasha, Wisc.: North Central Association of Colleges and Secondary Schools, 1962), XXXVI, No. 4, p. 328.

Brookover and Nosow question the value to the community of individuals who have not been adequately trained for participation in the world of work. They ask:

> Are youths likely to participate in community affairs, meeting their obligations as citizens and as parents? On the other hand, are communities with elaborate guidance and vocational education programs necessarily successful in providing their youth with fruitful adult roles in the larger community?[11]

These problems are ultimately based on the relationship between the labor market, the schools, and the community. The labor market provides the jobs, the schools a training for work and living, and the community provides the norms for the allocation of jobs among the socially acceptable and "marginal" groups in the community.

Within this framework there must be the freedom of occupational choice which has developed as an American ideal. Many of the federal acts have sought specifically to provide this occupational choice by alloting funds in the interest of the "general welfare" of the community and nation.

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[11] Brookover and Nosow, p. 22.

Technological and Societal Changes As They Affect Vocational-technical Education

The relatively recent changes in technology and its resulting change in the composition of the labor force, the expectations and norms of communities toward the world of work, and the general welfare of the nation led to several implications for vocational-technical education in the United States.

First, vocational-technical education has to be compatible with the job expectations of the individual. The school should not offer programs which are socially unacceptable and would degrade the prospective student. This acceptability will vary with individuals. Brookover and Nosow state that an individual's job expectations are usually class oriented and the probability is high that a son will enter the occupational level of his father. However, they continue, the societal mobility of individual results in a lesser likelihood of their having accurate images of occupations which are beyond those held by family, relatives, or friends. These factors place a great burden on the teacher and counselor for their need to thoroughly know and understand the student.[12]

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[12] Ibid., p. 47.

Second, the freedom of occupational choice, the declining proportion of workers in unskilled jobs, and the expansion of education to include a greater proportion of the working classes has resulted in a need for curriculum changes. The curricula must be in harmony with the needs of life, which in turn have changed with technological advances. The students nor the school can afford to spend time or money on information and courses that do not fit today's needs. Also, liberal or general education is being recognized as a part of the vocational education curriculum, with this liberal education being presented in its relationship to a vocational goal.

A third implication for education evolving from these societal and technological changes is the requirement of a high level of education based on courses which adapts the person to a number of jobs or gives him a base so that he may more easily prepare for a variety of jobs should the need arise.

Skill in the basic subjects such as reading and mathematics is an essential base to many of the vocational-technical curriculums. If the individual misses this basic material, he is handicapped throughout life in obtaining

specific vocational training at the levels which would provide him with mobility or advancement. Of a necessity, he will have to obtain this basic material sometime before being trained or retrained. Brookover and Nosow develop this further than many educators whey they say:

> The most valuable vocational training that can be provided in the elementary and secondary school for most youth is, therefore, in the basic education program which has not previously been identified as vocational education.[13]

This increase in the level of education needed by individuals to provide themselves with gainful employment poses problems for the educator in the area of these prerequisites. These problems stem from the fact that the school is supposed to provide persons with a skill and yet the general education prerequisites and the changing occupational structure make it difficult to do this. However, it appears that students who are directed into specific vocational programs early in the secondary school are deprived of many opportunities which might be open to them had they delayed specific training and in place of it relied on basic education with occupational orientation. Again, the sociological implications are set forth by Brookover and Nosow when they say:

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[13] Ibid., p. 37.

> It seems likely, therefore, that both the needs of the society and the occupational adjustment of individuals will be better served if specific vocational training is provided at the latest possible period in the educational career of the individual.[14]

If this statement could be assumed to include all types of occupations ranging from the unskilled to the professional, then of course this "latest possible period" would vary considerably among individuals depending on the type of program or curriculum they studied.

The fourth and last implication to be discussed here involves the possibility that vocational education of the future will be continuous throughout the working years of most individuals. A large proportion of the workers will change occupations several times before they retire. This means that new programs must constantly be added, certain old ones deleted, and counseling services aimed toward an increasing number of adults must be involved.

The need for adults to continue their education is emphasized by the Panel of Consultants.

> There is little doubt that most jobs in the generation ahead are going to require persons who are much more skilled, better trained and

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[14] Ibid., p. 42.

> better educated than in the past. The total amount of vocational education provided by all institutions and agencies is undoubtedly going to increase. . . . This is true in Agriculture and Industry, where the workers going to be needed are those who have a high degree of skill, the capacity to keep their skills up to date, and the willingness to add new skills. The construction industry, which at times in the past has been relatively slow to change, is changing in many aspects. The person in the building trades who is most likely to hold his job in the future is the one who is highly skilled and who is continuously adding new skills to meet the shifting requirements of new jobs. The office worker who has the best chance of remaining employed is the one of high competence who keeps his skills up to date. The same is true in most other fields.[15]

The problems posed for education by these social and technological changes was recognized and studied by this Panel. A significant contribution to the understanding of the need for vocational education in the United States was made by this group. Their report had a direct bearing on the recent acts by Congress, such as the Manpower Development Act of 1962, the Vocational Education Act of 1963, and the Economic Opportunity Act of 1964. Among the specific recommendations of this Panel are included the following:

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[15]Harold F. Clark, "The Economic and Social Background of Vocational Education in the United States," in Education for a Changing World of Work, Appendix III (Washington: U. S. Government Printing Office, 1963), p. 3.

> Vocational education must be made available to all people who have the need, the desire, and the ability to benefit from such instruction. To achieve this objective, it is recommended that:
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> 1. More high schools, junior colleges, and other post-high school institutions provide training for occupational skills.
> 2. Training programs be developed for occupations in which training is not now provided for which there are employment possibilities.
> 3. More attention be given to the education of women for employment.
> 4. Equal attention and equal opportunities be given to all, regardless of race, age, sex or national origin.
> 5. Area schools be developed to provide curriculums for many occupations, not restricted to persons in a certain area of residence.[16]

Education for occupational competency should be carefully correlated with the possibility of employment. To accomplish this, it is recommended that:

1. Local, State, and Federal employment service reports and predictions be made available to all schools.
2. All schools make available to State and Federal employment agencies statistics of enrollments and completions of training programs.
3. Where the size and complexity of the community justifies such an activity, the schools should take the leadership in establishing and maintaining an employment service, and

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[16]Report of the Panel of Consultants on Vocational Education, p. 222.

> local government. It should conduct surveys of community employment, training, and youth population, as well as suggest policy and evaluate community activities to training and employment.[17]

One of the above recommendations suggests that the need for training programs should be studied. A common method of determining this need is through a study of the opportunities in business and industry for various types of trained workers.

Summary

In this chapter an attempt has been made to present some of the technological and societal changes which have a bearing on the proper kind and level of vocational-technical education needed to be made available for youth and adults in the United States.

These changes have come about so rapidly and will continue to do so, that problems are posed for the community and for education. Persons who have not been adequately prepared for the world of work are of less value to the community than are those who have had adequate training. These

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[17] Ibid.

occupationally prepared persons are better able to meet their obligations as citizens and as parents.

These changing technological and societal conditions have demanded that vocational-technical education provide a socially acceptable program, a freedom of occupational choice, a broad basic training so the individual may be retrained easily by educational institutions or business and industry, and a program which meets today's business and industrial needs. A part of meeting today's needs is the development of primary occupational information such as is done in this study conducted in the service area of the Jasper County Junior College.

In Chapter III the writer will present a review of studies that are related to this study and which further illustrate the need for adding to and changing vocational-technical preparation programs.

CHAPTER III

REVIEW OF RELATED STUDIES

Introduction

In recent years numerous studies have been conducted involving occupational trends, numbers, and predictions. The U. S. Department of Labor, Bureau of Statistics, and the National Science Foundation have been quite active at the national level in the conducting of such studies. To a lesser extent nationwide studies have been conducted by the Department of Health, Education and Welfare. The state employment security commissions and universities frequently conduct statewide studies, while local area studies are often conducted by boards of education, chambers of commerce, and branch offices of employment security commissions, to name a few.

Nationwide studies involve such subjects as careers in individual occupations, employment changes in industries, and education and training programs which lead to jobs in specific fields. These nationwide studies are generally

very broad and in most cases do not pinpoint employment trends or numbers in a particular geographic area.

Statewide studies cover large areas geographically, but are valuable for the state as a whole in determining occupational needs. A large amount of information on occupations and employment opportunities is being published by state employment security agencies. Over 45 state agencies have published studies since 1957. Much of the data from these studies are used as occupational guides for employers, employees, branches of government, and educational institutions. Included in many of these reports is information concerning future manpower supply, characteristics of the work force, changes in state and area economies, and the employment structure of industries.[1]

A local area study can be the most valuable single method of determing local conditions. This is not to infer that local studies are the only guides for curriculum planning, but it does mean that they can be of primary importance. State and national trends can also be valuable in

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[1] Counselor's Guide to Occupational and Other Manpower Information, an Annotated Bibliography of Selected Government Publications (Washington: U. S. Government Printing Office, Bulletin No. 1421, November, 1964), p.12.

assessing vocational-technical program needs if they are used in relation to the local studies.

Many local studies have been limited to a particular technical group or groups, whereas this study of the Jasper County Junior College business and industry service area has attempted to cover various levels and types of occupations as long as they were of a post-high school nature yet below what is normally considered professional or requiring a baccalaureate degree.

The writer was unable to locate recent studies which either gave a count or a prediction of need for specific occupations in the service area of the Jasper County Junior College. The Joplin, Missouri, office of the Missouri Employment Security Commission, in 1963 conducted a limited study of certain occupations for use in developing Manpower Development Training Act programs, but they did not wish to divulge the information when it was requested by the writer. Other unfruitful requests concerning studies of the City of Joplin and the Jasper County area were through contacts of the State Employment Security Commission, State Department of Education, University of Missouri, local chambers of commerce, and local education institutions.

Reported here are examples of studies conducted at the national, state, and local levels. These studies appear to have varying relationships to this study through content and/or methodology.

National, State, and Local Occupational Surveys

A very encompassing study was conducted in 1962 by the Bureau of Labor Statistics of the United States Department of Labor.[2] The study was aimed at scientists and technicians in industry and, therefore, excluded many occupations below the professional level. Considerable emphasis was placed on the extent and type of work the person did as a technician, rather than the formal educational requirements of the position.

Findings relative to technicians showed that approximately half of all technicians were employed in four major industry groups; industrial services, electrical equipment, machinery, and transportation equipment.[3]

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[2] U. S. Department of Labor, Bureau of Labor Statistics, Employment of Scientific and Technical Personnel in Industry (Washington: U. S. Government Printing Office, Bulletin No. 1418, June, 1964).

[3] Ibid., p. 1.

As of January, 1962, there were 585,000 technicians in the United States according to the study. Of this number, 255,000 were engineering and physical science technicians; 213,000 were draftsmen; 17,000 were medical, agricultural, and biological technicians; and 101,000 were unclassified.[4]

A population sample of establishments was drawn for the study from compiled lists of firms reporting to state employment security agencies, supplemented by a list of interstate railroads and related companies.[5]

Questionnaires were mailed to this population sample, but in an effort to obtain a high percentage of response, some of the largest establishments were visited to discuss special reporting problems. At least two, but in most cases three, mail or telephone followups were made of all nonrespondents. Approximately 90% of the businesses in the sample supplied usable information.[6]

A problem common to many studies evolved here. This concerned the definition of the term "technician." The

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[4] Ibid., p. 13.

[5] Ibid., p. 74.

[6] Ibid.

Bureau of Labor Statistics' Study includes the following statement in recognition of this problem.

> The definition of the term "technician" was especially subject to variation in response. There is as yet no general agreement as to the meaning of this term, which covers positions with a variety of job titles differing among establishments. Consequently, the categories of personnel included in the figures reported on this item probably varied somewhat among respondents in the current survey, and between the current survey and earlier ones.[7]

The National Science Foundation in 1959[8] and the Bureau of Labor Statistics in 1962[9] report studies in relation to scientific and technical personnel in State government agencies. Both surveys were actually conducted by the Bureau of Statistics, with the 1959 survey being done for the National Science Foundation.

A comparison of the two reports shows scientific and technical employment to have increased nearly 20 percent between January 1959 and January 1962, averaging slightly over

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[7] Ibid., p. 75.

[8] Employment of Scientific and Technical Personnel in State Government Agencies, A report on a 1959 survey (Washington: U. S. Government Printing Office, 1961).

[9] U. S. Department of Labor, Bureau of Labor Statistics, Employment of Scientific and Technical Personnel in State Government Agencies, 1962 (Washington: U. S. Government Printing Office, Bulletin No. 1412, June 1964).

six percent per year. During this same period other comparable state employment increased 7 percent or about 2.3 percent per year.[10]

The questionnaire used in the 1962 survey was based on the 1959 instrument and the population was the same. At the close of the 1962 survey 98 percent of the questionnaires had been returned. This high percentage of return was the result of two follow-up letters and numerous telegrams and telephone calls.[11]

A significant study relating to employment opportunities and training needs for technicians in the State of Missouri was conducted by Prater in 1962.[12] The study attempted to answer questions concerning employment opportunities for technicians in Missouri from 1960 through 1970; training needs in selected industries; training opportunities compared with employment opportunities; and provide implications for programs needed in vocational-technical education in the State.

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[10] Ibid., p. 12.

[11] Ibid., pp. 63-65.

[12] Robert L. Prater, Employment Opportunities and Training Needs for Technicians in the State of Missouri with Projections through 1970 (Columbia: University of Missouri, Doctoral Dissertation, 1962).

The future employment opportunities for technicians was determined by ascertaining what technical occupations were likely to provide employment opportunities and then projecting these through 1970.

A total of 500 firms were sent information forms. After a followup letter and a second information form were sent to non-respondents, 30 percent of the questionnaires were returned and found usable.[13]

The number of technicians employed in manufacturing and non-manufacturing industries in Missouri is expected to increase from 13,466 in 1960 to 22,129 by 1970, an increase of approximately 65 percent. This growth in technical employment is expected to be more than four times greater than the overall growth in employment for the ten year period. The transportation equipment group, which has the largest employment of the manufacturing industries is expected to have the highest increase in the estimated number of technicians by 1970.[14]

Seventy percent of the employment opportunities for technicians in industry is expected to come from six of the

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[13] Ibid., p. 13.

[14] Ibid., p. 61.

manufacturing industries. These six include the transportation equipment industry with 4,142 opportunities; ordnance and miscellaneous manufacturing, 494; fabricated metal products, 723; electrical machinery, 709; chemical and allied products, 647; and machinery, except electrical, 636.[15]

The non-manufacturing groups provided less than 25 percent of the employment opportunities with the highest percent increase in this group of employees coming from a miscellaneous business service category which includes data processing.[16]

The difficulty in obtaining technicians for industry was ascertained by asking employers if they had experienced difficulty in securing trained technicians. The technical occupations which were listed as being difficult to fill by ten or more employers were: drafting, production, sales, inspection, electronics, maintenance, instrumentation, and laboratory.[17]

The health field employment opportunities were also researched in the study. A prediction of 4,482 employment

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[15] Ibid., pp. 69-72.

[16] Ibid., p. 72.

[17] Ibid., p. 78.

opportunities was made for this field by 1970. Sixty-five percent of these opportunities will become available because of normal employment and occupational growth. Thirty-five percent of them will become available because of normal separations from the labor force.[18] The total number of health service technicians entering the labor force during the 1960's will be 1,142 less than the expected employment opportunities.[19]

Prater made several conclusions relative to the projected employment opportunities and training needs for technicians in Missouri up to 1970. The following six of these are presented:

1. Employment opportunities for technicians in Missouri may be expected to continue at a high level throughout the decade.
2. In-service technical training is needed in most of Missouri's industries. Employers in these industries expect some of their in-service training needs to be provided by vocational-technical schools, area vocational schools and junior colleges.
3. Pre-employment training is not being provided in many of the technical occupations found in Missouri industries. The imbalance between pre-employment technical training programs and the technical occupations found

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[18] Ibid., p. 110.

[19] Ibid., p. 139.

in the State is sufficient to warrant considerable expansion of the technical curriculum in the public schools of the State.

4. Since a sizeable percentage of the employers in the state employ formally trained technicians, it seems reasonable to conclude that graduates of technical programs will have little difficulty in finding jobs.

5. Industrial employers in the State employ a high percentage of their technical workers direct from technical schools. They also expect the schools to play a major role in retraining displaced workers for technical occupations. Therefore, vocational-technical educators and school administrators face a real challenge from industry to accept the responsibility of assuring an adequate supply of technically trained workers.

6. In view of the fact that there is expected to be a shortage of trained medical technicians, and since the training prescribed for many medical laboratory workers is of shorter duration than the four years required for registered medical technologists, it is apparent that the imbalance between training opportunities and employment opportunities could be corrected, in part, by establishing some of the prescribed short-term pre-employment training programs in the public schools.[20]

Recommendations evolving from Prater's study include in part:

1. The junior colleges that are expected to be established in the state should devote a considerable portion of their facilities to the training of industrial and health service technicians.

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[20] Ibid., pp. 173-5.

2. Inasmuch as the employment opportunities for industrial technicians are expected to be more numerous than the training opportunities, additional technical programs will need to be started each year during the decade and they will have to be started at a faster rate than during the past few years.

3. Inasmuch as a shortage of trained technicians can hamper the industrial growth and the welfare of the State, as well as jeopardize our national defense, all interested groups should cooperate in developing adequate vocational-technical education programs.[21]

Another report of manpower over an entire state was conducted in 1962 by the Employment Security Commission of North Carolina.[22] By ascertaining the number of employees in various technical and skilled occupations, a picture of the significant industrial and occupational changes in the state was obtained. This study differed from many state surveys in that the results contained statistics by regions in addition to a report of the entire state. The regions were formed by dividing the state into six geographical subdivisions.

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[21] Ibid., pp. 175-7.

[22] North Carolina's Opportunity, A Digest of the North Carolina Study of Technical and Skilled Manpower (Raleigh: The Employment Security Commission of North Carolina, 1962).

The state scene in North Carolina appeared to follow closely the United States pattern in which the categories of common labor and farm workers are decreasing relative to the other occupations which require a higher level of education.

The five technical occupations for which employers indicated they would need the most workers for expansion and replacement by 1966 were: chemist assistants, production planners, estimators (nonmanufacturing), cost technicians, industrial technicians, and mechanical draftsmen. Needs for skilled employees during the same period appeared to be in the occupations of: carpenters, electricians, machinists, sheet metal workers, knitting machine fixers, and upholsterers.[23]

As might be expected, the rank by need of these technical and skilled occupations varied within the geographical regions of the state.

Shifts in importance of both industries and occupations have prompted the Michigan Employment Security Commission to become active in conducting occupational studies throughout the state. A pattern evolved from these studies and has been used extensively in occupational surveys. An

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[23] Ibid., p. 5.

occupational survey conducted in Calhoun County, Michigan, in 1960 provides a good example.[24]

A questionnaire was designed which listed 84 occupations that were likely to be in existence in Calhoun County. Employers were asked to give certain information about those occupations that existed in their businesses. The questionnaire asked for current employment numbers, current apprenticeship numbers, estimated number of employees two and five years hence, and the number of employees on training programs.

Two hundred eighty-nine firms responded to the questionnaire, but the report did not indicate the number of questionnaires mailed out. Reporting was summarized according to occupations, age, sex characteristics of employees, and industry of employment. These reported figures were projected to represent all non-farm wage and salary employment in the county. By multiplying the number of employed workers by labor force separation rates, estimates of withdrawals from the labor force (replacement needs) were also calculated.[25]

The summary of the findings of the Calhoun County Study showed that 136 of the 289 respondent employers

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[24] Calhoun County Plans for the Future (Detroit: Michigan Employment Security Commission, 1960).

[25] Ibid., p. 56.

projected that they would need more employees by 1965, 13 employers said they would need less, and the remaining 140 could see no change. Small firms most often anticipated no change in their personnel requirements. Tables were given listing the occupations that would be in surplus of qualified workers, those that would remain constant, and those in which shortages would occur. The vocational-technical occupations on the list of shortages included bookkeepers, bricklayers, chefs, commercial artists, electricians, medical technicians, plumbers, secretaries, stenographers, sheet metal workers, and tool and die makers.[26]

The Michigan Employment Security Commission also conducted an extensive survey in 1962 of occupations in the Detroit Metropolitan area (Wayne, Oakland, and Macomb counties).[27] The major purposes of this survey were (1) to determine prospective employer requirements in "significant" occupations, and (2) to provide a basis for the establishment of training programs under the Area Redevelopment Act. The survey covered all occupations in which shortages of

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[26] Ibid., pp. 12-31.

[27] Detroit Metropolitan Area Survey of Training Needs, Mayor's Committee Report (Detroit: Michigan Employment Security Commission, 1963).

qualified personnel were anticipated regardless of the length of the training period. Employers were asked to give their projections for occupations in which they believed there would be trouble obtaining qualified workers, and to indicate the number of shortages that would probably occur.

Questionnaires were mailed to approximately 8,000 employers in the Detroit Metropolitan Area. Questionnaires were returned by 2,285 firms (28.6%) and showed and employment total of 575,000 or approximately 50 percent of the total non-farm wage and salary employment in the area. Of the firms reporting, 254 anticipated shortages in one or more occupations.[28]

Classification of the hard-to-fill jobs was accomplished through use of the Dictionary of Occupational titles. Information was then coded on IBM cards for machine tabulation. Occupational data reported by the 254 firms were inflated to determine the total manpower shortages in the positions reported.

Reporting of the results was done through charts showing the demand, supply, and shortage of workers in hard-to-fill occupations, and through tables showing the industrial

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[28] Ibid., p. 2.

distribution of anticipated shortages in the hard-to-fill occupations.

A summary of the data gathered shows that 11,100 manpower shortages would occur in 205 occupations with the following breakdown:

(a) 79 occupations in the professional, technical, and managerial group would have 7,800 manpower shortages, or 70 percent of all the shortages.

(b) 85 skilled occupations would have 2,000 manpower shortages, or 18 percent of all shortages.

(c) 37 clerical and sales occupations would have 1,000 manpower shortages, or 9 percent of all the shortages.

(d) 4 service occupations would have 400 manpower shortages, or 3 percent of the shortages in all hard-to-fill occupations.[29]

A summary of the specific occupations in which shortages would occur in the Detroit Metropolitan Area shows that in the professional, technical, and managerial occupation group, the greatest need is for professionally trained

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[29] Ibid., p. 3.

teachers and nurses, but the engineering technicians rated high, as did medical technicians. The hard-to-fill clerical and sales occupations are key-punch operators, stenographers, and salesmen (especially in the sales of building and construction equipment supplies, and motor vehicles and supplies). The service occupations indicated shortages in waiters, practical nurses, hospital orderlies, and nurses aides. The skilled group of occupations had shortages in watch makers, tool makers, arc welders, milling machine operators, lathe operators, automobile mechanics, diesel mechanics, refrigeration mechanics, pipe fitters, cabinet makers, tool grinders, and butchers.[30]

The Kansas City School District studied the supply and demand factors for technical workers in the Kansas City Metropolitan Area.[31] Representatives of 480 firms were interviewed in an effort to determine the areas and extent of training needed for skilled and technical workers. An average of 11.8 percent of technicians were found to be employed by firms who employed technicians in the Kansas City area.

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[30] Ibid., pp. 27-31.

[31] Skilled and Technical Workers in Greater Kansas City: A Survey of Supply and Demand Factors (Kansas City: Board of Education, 1958).

The occupations in which there were reported to be an immediate need for trained persons were radio, electronic, and television technicians, and mechanical engineering aides. These occupations plus draftsmen and metallurgical technicians were seen as being in short supply five years hence.[32]

Vermilion County, Illinois, was the scene of a local area study during 1963. One of the specific objectives of the study was to find the number of practicing technicians in various technologies in the county.[33] This study, as do many local area studies, narrowed the scope of inquiry to the highly technical occupations and did not consider other vocational-technical occupations of a post-high school nature.

The basic design of the Vermilion County Study was directed toward future use of the information for curriculum development in the County. A secondary purpose, however, was to develop a pattern for future research efforts in technical education.

The identification of the total population in the study was accomplished by going through lists of industries

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[32] Ibid., pp. 21-31.

[33] Christy A. Murphy and others, Technician Need Study: Vermilion County, Illinois (Urbana: University of Illinois, May, 1964), p. 1.

supplied by associations, banks, chambers of commerce, credit bureaus, the Illinois State Employment Service, city directories, and telephone directories.[34]

Two instruments were developed for use in the study. The first of these was a structured interview form for use with firms which were identified as employing technicians. The second was a questionnaire to be filled out by technicians located during the interview with the employers.[35]

Personal contacts were made wherever possible throughout the study. During the interview of firms, the technicians were identified and listed by name. In most instances the technicians were then gathered together in a group and given the questionnaire material with a short verbal explanation. The technicians were then asked to take the material home, read it over, fill out the questionnaire, and return it. Followup letters were mailed to non-respondents. At the completion of this phase of the study, 67 percent or 344 responses were received from a total of 512 technicians contacted.[36]

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[34] Ibid., p. 19.

[35] Ibid., p. 20.

[36] Ibid., p. 22.

The firms interviewed not only indicated a need for technicians but many of them said that, in addition, a number of professional engineers could be replaced by competent, well trained technicians if such technicians were available. Such a reaction prompted the following statement in the report.

> It is quite possible that the current shortage of engineers is only an apparent shortage, that many engineers work as technicians because technicians are not available, and that the real shortage exists in the ranks of the technicians.[37]

Conclusions from this study evolved in general terms and included among several, the following:

1. Vermilion County firms employing technicians expressed definite interest in technical education. The reactions of these employing firms to the lack of technical education within Vermilion County were two courses of action: the majority of these firms were operating some sort of training program for employed technicians, and they were also hiring and bringing into Vermilion County technicians who had gained their training elsewhere.
2. The most frequently encountered fields of technology within Vermilion County were in order of their size; mechanical, electrical and electronic, and chemical. The employers expressed needs for individuals in each of these fields.[38]

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[37] Ibid., p. 25.

[38] Ibid., pp. 71-2.

Specific curricular conclusions were not drawn from the study, but as mentioned earlier, the conclusions were intended as an aid in the development of curriculum.

Kavieff, in 1962, reported a study of technicians for the automotive industry in the Detroit Metropolitan Area.[39] This study was a doctoral dissertation and also a publication from the Detroit Board of Education.

The reason for the study evolves from this statement in the introduction of the published report:

> Because of the expansion of the Detroit economy and the growing needs for specifically trained personnel, many local industrialists as well as educators felt that a survey of the present labor supply and demand was urgently needed.[40]

Kavieff limited his study to the transportation equipment group of the durable goods manufacturing classification from the Dictionary of Occupations. An interview was conducted with industrial employers who were directly concerned in the hiring of technical personnel within the industry.

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[39]Melvin C. Kavieff, Requirements for Selected Occupations in the Automotive Manufacturing Industry with Implications for Technical Education, A research study for the Detroit Board of Education (Detroit, The Board of Education of the School District of Detroit, 1962).

[40]Ibid., p. 1.

The range of formal education which was placed on the automotive industry technicians classifications in this study was wider than has been found in many other studies. Technicians were reported on the basis of the requirement of: no high school graduation; comprehensive high school graduation; technical or vocational high school graduation; technical institute graduation; two-years college non-technical program; engineering college graduation; and, non-engineering college graduation.[41]

The study produced a count of 22,873 technicians employed in all automotive industries in the Detroit metropolitan area in 1960 and projected a total of 46,135 by 1970.[42] The majority of the technicians reported were placed by employers in the group requiring a technical institute graduation. The number placed in this category was 15,944 for the year 1960 with a projection of 32,410 by 1970.[43]

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[41] Ibid., p. 52.

[42] Ibid., p. 50.

[43] Ibid., pp. 82-85.

Summary

Studies involving occupational surveys have been common at the national, state, and local levels. These studies have provided much practical information for use by federal, state, and local employment agencies, boards of education, and others interested in full employment and education for employment. The information has been used to determine occupational supply and demand, trends, predictions for the future, and for educational curriculum planning.

From this literature it appears that:

1. Most occupational information is obtained through employers rather than employees.

2. Most studies do not ask for employer predictions of need beyond a five year period.

3. The term "technician" is broad and the definition varies considerably between studies.

4. From all the studies reviewed, the greatest occupational need is for those jobs in which a post-high school education is required.

5. A common purpose of many studies is to recommend areas in which to plan educational curriculums.

In Chapter IV the writer will present demographic and industrial characteristics of the business and industry area served by the Jasper County Junior College. These facts are presented and analyzed so that the reader may become more familiar with the area covered in this study.

CHAPTER IV

DEMOGRAPHIC AND INDUSTRIAL CHARACTERISTICS OF THE AREA STUDIED

Introduction

By definition, the area covered in this study is comprised of the Jasper County Junior College business and industry service area. Out of the 683 businesses and industries identified as the population for the study, only four had addresses outside Jasper County. Therefore, pertinent statistics for Jasper County can be related to the college service area.

In this chapter are presented characteristics of Jasper County which will aid in an understanding of the area covered by the study.

Jasper County is in the southwest section of the State of Missouri. It includes an area of 642 square miles with dimensions approximately 31 miles east and west by 21 miles north and south. The county is surrounded by Barton, Lawrence, and Newton counties on the north, east, and southern sides. The west side is bordered by the State of Kansas.

Population Characteristics

In 1960 nearly one-half of the county's population was concentrated in the City of Joplin, which reported 38,958 persons. Other incorporated towns with population over 1,000 are Carthage with 11,264; Webb City with 6,740; Carterville with 1,443; Sarcoxie with 1,056; and Carl Junction with 1,220.[1]

Table 2 presents population figures for Jasper County, the State of Missouri, and the United States during 1940, 1950, and 1960 along with the percentage changes during these decades. These figures show that the percentage increase in population has not been as great for Jasper County or Missouri as it has been for the United States. Between 1940 and 1950 Jasper County increased .5 percent in population while during the same period the state increased 4.5 percent and the United States increased 14.6 percent. Between 1950 and 1960 the county lost .3 percent of its population while the state gained 9.3 percent and the nation gained 18.6 percent.

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[1] U. S. Bureau of Census PC (1) 27 Mo. 1960 Tables 22 and 23.

TABLE 2

POPULATION CHANGES FOR JASPER COUNTY, MISSOURI, AND THE UNITED STATES, 1940 to 1960

YEAR	JASPER COUNTY		MISSOURI		UNITED STATES	
	TOTAL POPULATION	PERCENT CHANGE FROM LAST CENSUS	TOTAL POPULATION	PERCENT CHANGE FROM LAST CENSUS	TOTAL POPULATION	PERCENT CHANGE FROM LAST CENSUS
1940	78,705	---	3,784,367	---	131,954,000	---
1950	79,106	+ .5%	3,954,653	+ 4.5%	151,234,000	+ 14.6%
1960	78,863	- .3%	4,320,774	+ 9.3%	179,323,175	+ 18.6%

Source: U. S. Census publication PC(1) 27c Mo. 1960; U. S. Census publication PC(1) 18 U. S. 1960; and Missouri County Data (Jefferson City: Missouri Division of Commerce and Industrial Development, 1964).

The population trends of Jasper County can be analyzed further through the figures presented in Table 3. The county's 1940 population of 78,705 was 2.07 percent of the population of the State of Missouri during that year. In 1950 this percentage of the state's population had decreased to 1.83 percent even though the actual population of the county had increased to 79,106. The 1960 population figures show another decrease compared to the state. By 1960 the percentage dropped to 1.82 percent of the state's. The total population also dropped between 1950 and 1960 to 78,863. Births in the

county increased considerably between 1940 and 1950 with deaths showing a slight decrease, but these factors were nearly offset by a heavy out-migration of the population. Between 1950 and 1960 the birth rate decreased, the death rate essentially stayed the same, and the heavy out-migration continued. This resulted in the slight loss of population during this period.

TABLE 3

JASPER COUNTY POPULATION TRENDS--1940 to 1960

	1940	1950	1960
Total Population	78,705	79,106	78,863
Percent of State	2.07%	1.83%	1.82%
Change from prior census	+4,895	+401	-243
Births since prior census	13,126	17,357	16,432
Deaths since prior census	10,943	10,348	10,347
Total migration change	+2,712	-6,608	-6,328

Source: Missouri County Data (Jefferson City: Missouri Division of Commerce and Industrial Development, 1964).

The heavy out-migration between 1940 and 1960 appears to be a major factor in the lack of a significant population increase for the 20 year period. Which segments of the

population are decreasing in relation to the total? In Table 4 it is shown that over the twenty year period from 1940 to 1960 three age groups lost in percentage of the total population of the county. These losses were in the 15 to 19 year old age group which dropped from 9.12 percent to 7.04 percent, the 20 to 29 year old age group from 17.64 percent down to 10.22 percent, and the 30 to 44 year old age group which dropped from 20.75 percent to 18.31 percent. The total percentage of persons in these three groups was 46.51 percent in 1940 and 35.57 percent in 1960. This was a drop of nearly 11 percent during the period. The largest increase of any group occurred among persons 65 years and older which changed from 8.96 percent of total population in 1940 to 13.97 percent in 1960 for an increase of 5.01 percent. The result has been a heavy loss of those persons between the ages which make up a majority of the persons productively employed.

Presented on Table 5 for purposes of comparison are selected social and economic characteristics for Jasper County, the State of Missouri, and the United States.

The population per square mile for Jasper County is 123. This figure is considerably greater than the average of 63 per square mile for Missouri or the 50.5 per square mile for the United States. However, the percentage of

persons in urban residence is only slightly higher in the county than for either Missouri or the United States. Heavily populated rural areas account for this relationship.

TABLE 4

POPULATION DISTRIBUTION BY AGE GROUPS
JASPER COUNTY--1940 to 1960

Age Distribution	1940		1950		1960	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Under 5 yrs	5,846	7.42	7,630	9.64	7,590	9.62
5 to 14 yrs	12,723	16.16	12,426	15.70	14,498	18.38
15 to 19 yrs	7,184	9.12	5,312	6.71	5,552	7.04
20 to 29 yrs	13,101	16.64	10,550	13.33	8,063	10.22
30 to 44 yrs	16,336	20.75	16,712	21.12	14,447	18.31
45 to 64 yrs	16,463	20.91	17,249	21.80	17,692	22.43
65 yrs &over	7,052	8.96	9,227	11.66	11,021	13.97
Median Age			33.3		34.0	

Source: Missouri County Data (Jefferson City: Missouri Division of Commerce and Industrial Development, 1964).

The percentage of persons in Jasper County over the age of 21 is 64 percent. This is over 2 percent greater than for Missouri and nearly 4 percent greater than for the United States. The difference becomes wider in the age group of persons 65 years and older. The 14.4 percent of persons in Jasper County in this age group is 2.7 percent more than for

Missouri and 5.2 percent greater than the United States. The net result is a higher median age of the population for Jasper County.

TABLE 5

SELECTED SOCIAL AND ECONOMIC CHARACTERISTICS FOR JASPER COUNTY, MISSOURI, AND THE UNITED STATES--1960

	Jasper County	Missouri	United States
Per square mile population	123.0	63.0	50.5
Urban residence	70.1%	66.6%	69.9%
Age 21 years and over	64.0%	62.4%	60.3%
Age 65 years and over	14.4%	11.7%	9.2%
Median age in years	34	31.6	29.5
1959 median income per family	$4,432	$5,127	$5,660
Families with income under $3,000	31.2%	27.0%	21.4%
Families with income over $10,000	7.6%	11.8%	15.1%
Unemployment	5.4%	4.1%	5.1%
Median school years completed by persons 25 years and older	10.0	9.6	10.6
Persons 25 years old or more who completed less than 5 yrs. school	6.0%	7.1%	8.4%
Persons 25 years old or more who completed high school or more	37.6%	36.6%	41.1%

Note: This source presents a slightly higher percentage of persons 65 years and older than does the information from the Missouri County Data shown on Table 4.

Source: Table adapted from County and City Data Book, 1962, U. S. Bureau of Census (Washington: Government Printing Office, 1962), pp. 2-11 and 204-211.

The median family income in the county is lower than for either the state or the nation as shown on Table 5. The

1959 median income of $4,432 per family in the county was $695 less than the $5,127 median family income for Missouri and $1,228 less than the $5,660 median income of all families in the United States. The percentage of families with less than a $3,000 income per year is greater in the county than for Missouri or the United States. Correspondingly, the percentage of families with income over $10,000 is less than Missouri or the United States.

Unemployment in the county during 1960 was 1.3 percent higher than for Missouri, but only .3 percent higher than the national average of 5.1 percent.

Through this same table is also shown the educational characteristics of persons 25 years and older. In Jasper County the average number of years of school completed is 10.0. This figure is slightly higher than the state average but slightly lower than for the average person in the United States. The county is in a good position relative to Missouri and the United States concerning persons with less than 5 years of education. Jasper County has only 6 percent of its adult population with less than 5 years of school while Missouri has 7.1 percent and the United States average is 8.4 percent. The percentage of adults in Jasper County

who have completed high school or more is 37.6 percent. This is only slightly higher than the 36.6 percent for Missouri, but nearly 3.5 percent lower than the 41.1 percent for the United States.

Industry Characteristics

A comparison of Jasper County with the state and the nation in major industry groups is presented on Table 6. Here is shown the number and percent of employees as presented in the Bureau of Census publication County Business Patterns. These figures for Jasper County, with certain explained modifications are used later in this study for the basic employment numbers in analyzing the percentage of return on questionnaires. It should be noted that this is an industry classification which basically includes only those employees covered in the U. S. Government Federal Insurance Contribution Act reports.

The percentage of employment in Jasper County by industry grouping is surprisingly similar to the state and the nation. Manufacturing, the largest group, accounts for 38.1 percent of the employment in the county and is only slightly higher than the state which has 35.2 percent and the nation

which has 37.7 percent of the employment in this group. The transportation, communication, and public utilities group is also slightly higher in percentage of employees than for Missouri or the United States. This small lead may be due to the fact that the City of Joplin is the center for a large electric utility which serves a wide area beyond Jasper County. Employees are stationed in the county to administer and operate the entire utility.

A ranking of the industrial groupings by number of employees produces the following order for Jasper County: 1) manufacturing, 2) retail trade, 3) services, 4) wholesale trade, 5) transportation, communication, and public utilities, 6) contract construction, 7) finance, insurance, and real estate, 8) mining, and 9) agricultural services, forestry, and fisheries. The State of Missouri and the United States follow this same ranking with one exception. In both Missouri and the United States the finance, insurance, and real estate grouping is slightly ahead of contract construction.

TABLE 6

EMPLOYERS BY MAJOR INDUSTRY GROUPING FOR JASPER COUNTY, MISSOURI, AND THE UNITED STATES

	Jasper County		Missouri		United States	
	Number	%	Number	%	Number	%
Agricultural Services, Forestry & Fisheries	27	0.1%	3,131	.3%	130,448	.3%
Mining	251	1.3%	7,259	.7%	622,125	1.4%
Contract Construct'n	832	4.3%	51,240	4.8%	2,425,889	5.6%
Manufacturing	7,393	38.1%	374,560	35.2%	16,413,787	37.7%
Transportat'n, Communicat'n, & Public Utilities	1,634	8.4%	82,776	7.8%	3,010,632	6.9%
Wholesale Trade	1,766	9.1%	97,187	9.1%	3,239,698	7.4%
Retail Trade	3,688	19.0%	207,027	19.4%	8,045,023	18.5%
Finance, Insurance, & Real Estate	804	4.1%	73,548	6.9%	2,723,335	6.3%
Services	2,920	15.0%	162,280	15.2%	6,615,266	15.2%
Unclassified	112	.6%	6,337	.6%	286,149	.7%
Total	19,427	100.0%	1,065,345	100.0%	43,512,352	100.0%

Source: County Business Patterns, First Quarter 1962, Part 1 and 5A, U. S. Department of Commerce, Bureau of the Census (U. S. Government Printing Office, Washington, D. C., 1962).

Summary

In this chapter have been presented selected demographic and industry characteristics of Jasper County. This county is essentially the business and industry service area for the Jasper County Junior College and the area covered by this study. Most of the factors discussed have been presented in their relationship to the State of Missouri and to the United States.

The following factors relative to Jasper County have been brought out in this chapter.

1. The county gained very little in total population between 1940 and 1960 and its relative position to Missouri and to the United States decreased. This lack of population increase was largely due to a heavy out-migration of persons during this period.

2. Between 1940 and 1960 the age groups between 20 and 44 years which make up a majority of persons productively employed dropped from 46.51 percent to 35.57 percent for a loss of nearly 11 percent. Correspondingly the median age of the population increased slightly.

3. The median income per family in the county during 1960 was lower than for Missouri or the United States.

4. Unemployment during 1960 was 1.3 percent greater than for Missouri, but only .3 percent greater than for the nation.

5. The average and median educational attainments by adults in Jasper County is slightly greater than the state but slightly less than the nation.

6. Industrial groupings show manufacturing to have the largest group of employees in the county. Retail trade, services, and wholesale trade follow in that order. These groupings follow very closely the patterns of industrial groupings for the state and nation.

In Chapter V the methodology of the study is presented. Following this is an analysis of responses from those employers who reported employing persons who needed the vocational-technical training as specified on the questionnaire.

CHAPTER V

METHODOLOGY AND ANALYSIS OF RESULTS

Introduction

Smith and Lipsett indicate a problem which is inherent in determining the demand for vocational-technical education. This problem lies in the fact that statistics refer to the past while education serves the future. Some industries and occupations expand while others contract. But since most changes occur gradually, it can be expected that statistics will hold up for a reasonable length of time.[1] Education, then, must be concerned with the long range plans if expensive equipment and facilities are going to be acquired. For the most part, it will have to consider short term education only as the investment warrants such action.

The review of literature has shown that most numerical occupational information is obtained from employers.

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[1]Leo F. Smith and Laurence Lipsett, The Technical Institute (New York: McGraw-Hill, 1956), p. 114.

Many employers have the occupations categorized for their own or governmental purposes and often it is only a matter of transferring information from a record file to a questionnaire. Also, within a firm, the name attached to a particular occupation is likely to be consistent as to the requirements of the position.

Another way of obtaining this occupational information is through the employees themselves. The disadvantages of this system are obvious for the study being conducted here. Obtaining information through employees is costly and time consuming because of the added number of contacts necessary. Also, less coordination between job titles is possible unless preliminary contacts and interviews have been made with the employers. Therefore a contact of employers was used for this study.

Construction and Validation of The Survey Instrument

The writer desired to determine the following information from the businesses and industries surveyed in the Jasper County Junior College service area.

A. The type of business activities engaged in by the responding firms.

B. The total number of employees in these firms, regardless of responsibility.

C. The method by which these firms obtain their semi-professional, and technical employees, that is, those employees which the employer desired to have some post-high school training.

D. The extent to which business and industry representatives would be willing to serve on vocational-technical advisory committees for the community college.

E. The number of persons employed in jobs that require some type of post-high school education less than a baccalaureate degree.

F. The occupations in which these persons are employed.

G. The past and future growth of these occupations within the area.

H. The employer's opinion as to the adequacy of the present local supply of employees for these occupations.

I. The employers' opinions concerning whether or not certain programs in the Jasper County Junior College could be of help to them in securing new employees.

Several of the studies reviewed in Chapter III were useful in obtaining information on possible job titles. Of special value was a list of job titles formulated by Harris[2] for use in his vocational-technical studies. The Dictionary of Occupational Titles[3] were also a valuable source. Frequent discussions of the instrument in a graduate students' seminar were productive in question clarification as were suggestions from Michigan State University staff members.

On recommendation of the writer's graduate guidance committee, the questionnaire items were reviewed in conferences with two persons representing manufacturers in the vicinity of Michigan State University. One of these individuals was Mr. R. L. Shong, Coordinator-Salaried Personnel, Oldsmobile Division, General Motors, Inc., and the other was Mr. John K. McEvoy, Supervisor of Education and Training, A. C.

[2]Norman C. Harris, Professor of Technical Education, The University of Michigan, Ann Arbor, Michigan.

[3]U. S. Department of Labor, Bureau of Employment Security, Dictionary of Occupational Titles (Washington, D. C.: Superintendent of Documents, 1949).

Sparkplug Company. These men gave valuable suggestions, especially for the industrial type jobs listed on the questionnaire.

The next step was to validate the questionnaire in the Jasper County Junior College business and industry service area. It was decided to conduct this validation through an advisory committee, representing business and industry in the area. With the cooperation of the administrative staff of the Jasper County Junior College, eight persons were asked and accepted invitations to become members of this advisory committee. Membership included four educational and personnel directors representing manufacturing concerns, an optometrist, a medical doctor, a retail store manager, and the personnel manager of an electric utility. The vocational-technical director and the writer represented the College on this committee. The President and the Dean of the College were also in attendance during the initial meeting of the committee.

This committee suggested several minor changes in job listings. These changes resulted in easier understanding of job classifications in the particular geographical locality being studied. One major change was advocated by the committee. The original questionnaire asked for definite

employee numbers in connection with the past and future growth of occupations. The committee members believed that most firms (especially the larger manufacturers) would not desire to reveal (if they even had exact figures) the number of employee changes in the various post-high school occupations. The committee did, though, believe that the three terms "decrease," "no change," and "increase," concerning past and future growth of occupations would be answered by the respondents. This change was made in the questionnaire (See questions concerning "past" and "future" growth on pages 2 through 4 on questionnaire, Appendix B).

After validating the questionnaire through the methods described above, it was then mailed to twenty-four firms in the population to check the reliability of the answers. This was done before the general mailing occurred. These twenty-four firms were contacted by telephone and an appointed time was set for the questionnaire to be picked up. In a few cases where the pick-up time could not be arranged, the questionnaire was mailed back. Each recipient of the questionnaire was asked if he had any trouble in understanding the questions or supplying the answers. One change in the questionnaire was made as a result of this procedure. Question number six originally read as follows:

> Please check the space opposite the description which best identifies the activities of your firm. If you do business in more than one area please mark 1, 2, 3, for your top three choices.

Apparently the respondents had a tendency to read the question hurriedly because several of them merely placed a check mark beside the activity or activities of their firms and did not indicate the order of importance. This problem was eliminated by changing the sentence to read:

> Please mark in 1, 2, 3, order the space opposite the description which best identifies the activities of your firm.

Data Collection Procedures

During the time that the questionnaire was being validated, the population to which questionnaires would be sent was identified.

Telephone directories were used as a prime source of obtaining the names of businesses. All businesses listed in the white pages of the telephone directories for Jasper County were typed to form a list. All businesses were included in this first list, regardless of size or type. This list contained approximately 1,800 names.

The population for the study was determined by the following criteria applied to the master list.

A. All businesses in Jasper County with five or more employees with the following eliminations:

   1. Taverns and bars, regardless of size.

   2. Barber shops, beauty shops, barber schools, and beauty schools, regardless of size.

   3. All farms, regardless of size.

B. Certain businesses included even if they had less than five employees. These were: medical doctors, attorneys, accountants, dentists, and optometrists.

C. Certain businesses outside but close to the legal service area of the college added to the list because of their close economic tie to the area.

A total of seven people were asked to go through the list and pick out those firms which they believed to fit the criteria. Three of the seven persons reviewed the entire list and four persons reviewed areas in which they were most familiar. The reviewers were asked to include the name of a firm on the study population list if there was a doubt as to whether or not it met the criteria. As a result of this decision, a few questionnaires were mailed out and returned

from firms which did not meet the criteria. This was not a problem, though, in the remainder of the study.

Those names meeting the selection criteria were then typed as a separate list. This second list consisted of 683 firms and was used as the population for the study.

On Friday, February 26th, 1965, the first mailing went out. This mailing consisted of the following items:

1. Introductory and explanation letter (See Appendix A),
2. One copy of the questionnaire (See Appendix B), and
3. A self-addressed and stamped return envelope.

The second mailing was done on March 12, 1965, and consisted of a follow-up letter to non-respondents asking for the return of the questionnaire (See Appendix C).

On March 22, 1965, the following material was sent to the non-respondents.

1. Second follow-up letter (See Appendix D),
2. A copy of the original cover letter with explanation of the study,
3. A second copy of the questionnaire, and
4. A second self-addressed stamped envelope.

One week after the last mailing occurred, twenty non-responding firms were called by telephone to ascertain their reason for not responding. Several questionnaires were received from this group after the telephone contacts. The reasons for not responding were generally two:

A. The employer had no employees to be included in the questionnaire so he neglected returning it. This occurred in spite of the fact that the original cover letter included the following statement: "In the event that you have no employees who would need training above the high school level, please complete page one only and return it in the enclosed envelope."

B. Person who would fill out questionnaire was unavailable.

Publicity for the Study

The writer believed that a successful occupational survey could be more nearly achieved if publicity were obtained at critical times during the study. Therefore, several items for publicity were given to the newspapers in the area. Stories were also released to the television and radio

stations. These types of news media accounted for a total of six stories. In addition, the writer appeared before several civic groups and told of the survey. Other members of the Jasper County Junior College administrative staff also told of the survey in their appearances before civic groups.

Analyzing the Data

The jobs reported by the businesses and industries in the Jasper County Junior College business and industy service area are discussed in this chapter according to the broad occupational areas of industrial, health, business, agricultural service, and public service occupations as used by Harris.[4]

Each broad occupational group contains the various occupations as listed on the questionnaire, plus a few which appeared as write-ins and seemed to be significant. Definitions for each of these occupations may be found in Appendix E.

Within each broad category, many smaller groups or families of occupations are identified. This is done according to those that would normally have a similar set of courses during much of the training period.

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[4]Norman C. Harris, Professor of Technical Educations, The University of Michigan, Ann Arbor, Michigan.

Items discussed and presented on tables concerning each significant occupation or group of occupations include:

A. Total number of firms reporting the job,

B. Total employees in the job,

C. Number of women and number of men in each occupation,

D. The total number of trainees during 1964 and the percentage of this number in that occupation during that same year,

E. The total number of replacements during 1964 and the percentage to the total number of employees,

F. The growth of the occupation over the past five years,

G. The expected growth of the occupation over the next five-year period of 1965 to 1970,

H. The employer's opinion as to the local supply of workers trained for this occupation, and

I. The opinion of the employers as to the help that the Jasper County Junior College might be to them in preparing new employees for the occupations reported.

It should be noted again that these classifications do not correspond to the categories used in the U. S. Census Classifications or the County Business Data Patterns publications for industrial groupings. They are grouped here according to occupational similarities for educational purposes. As an illustration, consider a general secretary. The secretarial occupation is listed on the questionnaire and in the analysis under "Business" occupations. This is done for training purposes and in actual practice a secretary would obtain a job in one of the several industrial classifications listed, such as mining, contract construction, or manufacturing.

Questionnaire Returns

A total of 683 firms were identified and mailed questionnaires. Of this number 420 or 61.5 percent were returned within a thirty day period of the first mailing. Twenty-five responses out of the 420 were rendered unusable because they contained no information other than the respondent's name. Therefore, 395 or 57.8 percent of the questionnaires were usable returns.

Estimate of the Total Number of Employees Included in the Survey Compared to Actual Returns

A total of 14,430 employees were reported through question number four of the questionnaire. This figure includes all employees of these firms regardless of the type or extent of education required for the occupation. Therefore, only part of these employees were listed later in the questionnaire under the occupations requiring a post-high school education of the type possible in the vocational-technical programs of the community college.

The writer has attempted to estimate the total number of employees included in the survey. This figure would theoretically correspond to the number of employees which would have been reported on the questionnaires if 100% of them had been returned.

The reason for doing this is so a comparison may be made between the number of employees reported on the returned questionnaires and the estimate of the total possible employees.

Two figures were found concerning the number of persons employed in Jasper County. These were:

1. U. S. Bureau of Census 1960 listed 27,572 employees.[5]
2. County Business Patterns 1962 listed 19,450 employees.[6]

The 1960 figures from the U. S. Bureau of Census Report presents the total of all workers regardless of type or length of time on the job and as reported by the workers themselves on the 1960 census returns.

The County Business Patterns report represents employment covered under the Federal Insurance Contributions Act for:

1. All covered wage and salary employment of nonfarm industrial and commercial employers, and of nonprofit membership organizations under compulsory coverage; and
2. All employment of religious, charitable, educational, and other nonprofit organizations covered under the

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[5]U. S. Bureau of Census, U. S. Census of Population: 1960, General Social and Economic Characteristics, Missouri, Final Report PC (1)-27c (Washington: U. S. Government Printing Office, 1962), p. 285.

[6]U. S. Bureau of Census, County Business Patterns, First Quarter 1962, Part 5A, West North Central (Iowa, Minnesota, Missouri) (Washington: U. S. Government Printing Office, 1963), p. 206.

elective provisions of the Federal Insurance Contributions Act.

Data from the following types of employment covered by the Social Security Program in whole or in part are excluded from the basic tabulation in the 1962 edition of County Business Patterns: Farm workers, domestic workers, self-employed persons, members of the uniformed services of the United States, Federal civilian employees, and employees of State and local governments. Also railroad employment subject to the Railroad Retirement Act and the employment on oceanborne vessels is not included.[7]

The writer believes that the County Business Patterns figure of 19,450 employees, applied here with certain modifications can be used as an estimate of the total population covered by this study. Reasons for this decision are:

1. Small businesses that are not included in social security provisions, in general, also are left out of the survey because of the size criteria used to identify firms in which to send questionnaires.

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[7] Ibid., p. 1.

2. The figures used in the County Business Patterns publication are from employer reports as are figures given on the survey returns.

3. In general the same areas are left out of the County Business Patterns (abbreviated C.B.P.) as were left out of the survey population. (Example: farm labor, self employed persons, etc.)

The following are the calculations made in arriving at an estimated figure of the total population in the survey.

	Add	Delete
1. Total employment figure presented by C.B.P. for Jasper County.....	19,450	
2. The C.B.P. shows 1,093 businesses with one to three employees. An average of two per business produces those not intended to be covered in the survey--2x1,093.....		2,186
3. The C.B.P. shows 337 businesses with four to eight employees. An average of 5.5 employees per business equals 1,853 total employees in the category. One-fourth of this 1,853 is deleted because the survey covered those businesses with five or more employees--1/4x1,853.....		463
4. Medical Doctors, Accountants, and other small businesses which were		

		Add	Delete
	surveyed yet had less than five employees.....	200	
5.	Estimate of those employees in businesses outside of the County but within the Jasper County Junior College service area.....	2,000	
6.	School employees included in C.B.P. but not in survey (estimate of those above four employees).....		500
7.	Religious and charitable organizations with above four employees...		275
8.	Barber shops, beauty shops, with above four employees.....		20
9.	Liquor and certain eating establishments above four employees.....		200
10.	Governmental employees in municipal jobs.....	100	
	TOTALS.....	+21,750	-3,644
	Estimate of total employees in survey population.....		18,106

Therefore, the 14,430 employees reported on the payrolls of the responding firms represent approximately 79.7% of the 18,106 employees estimated as the total population in the survey.

Questionnaire Returns by Industrial Classification and Employee Numbers

The industrial classifications used by the County Business Patterns was adopted, with a few revisions, as a basis for the organization of firms in this study. The revisions were in (1) Agriculture, Forestry and Fishing, which was limited to Agricultural Services; (2) Government, which was considered as Public Service and included in the Services classification; and (3) Wholesale and Retail, which were combined. The broad classifications used for the summaries of this study evolve as: 1) Agricultural Services; 2) Mining; 3) Contract Construction; 4) Manufacturing; 5) Transportation, Communication, and Public Utilities; 6) Wholesale and Retail Trade; 7) Finance, Insurance, and Real Estate; and 8) Services. It should be noted that these classifications were broken down further on the questionnaire (See Question six, Appendix B) to aid the respondents in filling out the form, but for summary and analysis purposes, they were grouped into the above eight classifications.

Throughout the study it is important to understand this industry grouping on the one hand and occupational grouping on the other hand as both are referred to

throughout the study. The industry classification or grouping describes where a man works, and the occupational classification or grouping describes what he does. At present, then, we are interested in the industry classifications.

In order to check the questionnaire returns to see if they were representative of all employer classifications and employee sizes, two tables were prepared. Table 7 presents the total questionnaires estimated to have been mailed to firms in each industry classification compared with the actual number of questionnaires returned for each of the same classifications. The estimations on this table were formed by applying the same criteria to the County Business Patterns classifications as was applied to the business and industry list used for mailing out the questionnaires (See page 78). A limitation to these estimates lies in the fact that the County Business Patterns information was published in 1962, while the study was conducted for the year 1964. It would be likely that during this period of two years some businesses would change size and/or industrial classification. The highest rate of return as shown by this table was from the Finance, Insurance, and Real Estate classification with a 79.0 percent return. Also the Services classification with a 73.3 percent return was high. An excellent

response on the part of those businesses dealing in the Health type services increased the percentage for the Services classification. The lowest rate of return was Mining with 25 percent and Contract Construction with an approximate 27.5 percent return.

TABLE 7

ACTUAL QUESTIONNAIRE RETURNS COMPARED TO ESTIMATED POSSIBLE RETURNS BY INDUSTRY CLASSIFICATION

Industry Classification	Actual Returns	Number Estimated Possible Returns	Percent Returns
Agricultural Services	3	7	42.9%
Mining	1	4	25.0%
Contract Construction	11	40	27.5%
Manufacturing	60	95	63.2%
Transportation, Communication, and Public Utilities	25	38	65.8%
Wholesale or Retail	114	257	44.4%
Finance, Insurance, and Real Estate	49	62	79.0%
Services	132	180	73.3%
TOTALS....	395	683	57.8%

Table 8 shows a comparison of actual questionnaire returns with the estimated possible returns using the employee

size of firm as the standard. This comparison reveals that the businesses with more employees tended to return questionnaires to a greater extent than did those businesses with fewer employees. An estimate of four businesses was made for the "500 employees or more" range. All four questionnaires were returned from this group. The lowest percentage of returns, 42 percent, was received from businesses employing from eight to nineteen persons. The businesses employing from one to three persons had an 83 percent return. The high response in this one to three employee group is probably due to the fact that the small businesses were for the most part a select group (medical doctors, lawyers, accountants, dentists, and optometrists) and the interest was high on the part of the representatives of these businesses. The one hundred to 249 employee group also had an 83 percent return.

The high percentage of returns from the larger employers accounts for the fact that a much greater number of employees was covered in the survey than would be indicated by the total percentage return of questionnaires, that is, there were 57.8 percent usable questionnaire returns but 79.7 percent coverage of total employees in the study population.

TABLE 8

ACTUAL QUESTIONNAIRE RETURNS COMPARED TO ESTIMATED POSSIBLE RETURNS BY EMPLOYER SIZE OF FIRM

Number of Employees in Firm	Number Actual Returns	Number Estimated Possible Returns	Percent Returns
1 to 3	100	120	83.3%
4 to 6	94	174	54.0%
8 to 19	84	200	42.0%
20 to 49	62	116	53.4%
50 to 99	25	36	69.4%
100 to 249	20	24	83.3%
250 to 499	6	9	66.7%
500 or more	4	4	100.0%

Position of Person Answering Questionnaire

Question number five on the questionnaire (See Appendix B) asked the respondent to check his position within the firm. Table 9 presents the responses to this question.

TABLE 9

POSITION IN FIRM OF PERSON ANSWERING THE QUESTIONNAIRE

Position	Number of Responses	Percent
Owner or Owner Manager	228	57.7%
Manager	107	27.1%
Personnel Manager	22	5.6%
Educational Director	3	.8%
Office Manager	9	2.3%
Bookkeeper	6	1.5%
Secretary	5	1.2%
Other	9	2.3%
No response	6	1.5%
TOTALS	395	100.0%

Most questionnaires were answered by top management persons within the firms. It may be assumed that these persons were in a position to know or have access to the information requested. Owners and owner managers, managers, personnel managers, and educational directors numbered 360 or 91.1 percent of the total questionnaires returned. Responses listed in the "other" category were cashier, city clerk, design engineer, nurse, project director, and two comptrollers.

Source of Employees

Receivers of the questionnaire were asked to list in order of importance three sources they used to obtain skilled, semi-professional, or technical employees. Seven methods, plus an "other" column were listed. Three choices were asked for, but only two were analyzed because the number of respondents who checked all three was very small. Of the 395 questionnaires returned and found usable, 368 made a first choice, while 246 made both a first and second choice, and only 136 made all three choices.

The main source for obtaining employees by the firms responding in the Jasper County Junior College business and industry service area is through unsolicited applications. Table 10 shows that 36.2 percent of the respondents listed this as the most important source and 15.6 percent listed it as the second most important source. These two total 51.9 percent who use this method of obtaining employees as first or second in importance. Upgrading employees ranked second with 77 or 19.5 percent marking it as their most important method of obtaining the type of employees listed on the questionnaire.

Schools and advertising for employees ran as poor thirds, while unions were insignificant, rating at the bottom of both the first and second choices.

TABLE 10

SOURCES OF OBTAINING SKILLED, SEMI-PROFESSIONAL, AND TECHNICAL EMPLOYEES BY EMPLOYERS IN THE JASPER COUNTY JUNIOR COLLEGE SERVICE AREA

Source	First Choice		Second Choice	
	Number of Firms	Percent	Number of Firms	Percent
Unsolicited applications	143	36.2%	62	15.7%
Upgrading employees	77	19.5%	45	11.4%
Advertising	30	7.6%	27	6.8%
Schools	30	7.6%	25	6.3%
Private employment agencies	27	6.8%	25	6.3%
State employment office	25	6.3%	39	9.9%
Union	16	4.1%	5	1.3%
Other	20	5.1%	18	4.6%
No answer	27	6.8%	149	37.7%
TOTALS	395	100.0%	395	100.0%

Support for Advisory Committees

If the administration of the Jasper County Junior College should elect to implement new programs and strengthen present programs in the vocational-technical department of the college it would be advantageous to obtain the cooperation of employers to serve on advisory committees for these programs. Advisory committees may be used effectively for checking the details of curriculum planning, selecting equipment, placing graduates, serving as a source of speakers and field trips, and providing program evaluation.

In an effort to determine the advisory committee support that might be expected from employers, the following question was asked, "Would a representative of your firm be willing to serve on an advisory committee in the development of vocational-technical programs of study in the Jasper County Junior College?"

Slightly more than one-third of the respondents indicated a definite interest in serving on an advisory committee for the college as shown in Table 11. The questionnaire did not ask for the name of the individual who would be this representative, and several respondents added

a statement indicating that the representative would not be the one who filled out the questionnaire. These were reasonable answers because the advisory committee representatives would have to be familiar with the program areas being considered by the college and firms should send the most qualified persons as representatives.

TABLE 11

NUMBER AND PERCENTAGE OF RESPONDENTS WHO OFFERED TO SERVE ON JASPER COUNTY JUNIOR COLLEGE ADVISORY COMMITTEES

Response	Number Responding	Percent
Yes	137	34.7%
Undecided	132	33.4%
No	101	25.6%
No response	25	6.3%
TOTAL	395	100.0%

Another one-third indicated they were undecided. Several of these might be expected to answer affirmatively if the need for their help were to arise. Assuming those who did not respond would not be available for advisory committees, these combined with the "no" responses account for the remaining one-third.

Which industrial classifications of firms appear to show the most interest in working with the college on vocational-technical progress? To answer this question broadly, the 137 firms which answered "yes" to the advisory committee question were grouped in Table 12.

TABLE 12

ADVISORY COMMITTEE SUPPORT BY INDUSTRIAL CLASSIFICATION

Main Activity of Firm	Total Returns in Category	Firms Answering Yes	Percent
Agricultural Services	3	1	33.3%
Mining	1	0	0
Contract Construction	11	0	0
Manufacturing	60	22	36.7%
Transportation, Communication & Public Util.	25	10	40.0%
Wholesale and Retail	114	30	26.3%
Finance, Insurance, and Real Estate	49	23	46.9%
Services	132	51	38.6%
TOTAL	395	137	--

In the industrial classifications of Mining and Contract Construction there was no indication of willingness

to make definite commitments for serving on advisory committees. In the other classifications the range of "yes" answers ran from 26.3 percent in Wholesale and Retail Trade to 46.9 percent in the Finance, Insurance, and Real Estate category. Except for the two classifications of Mining, and Contract Construction, and possibly Agricultural Services due to lack of numbers, advisory help seems assured in nearly any program the college finds it advisable to consider based on the occupations reported on the questionnaire.

Industrial Occupations Reported

This is the first of the occupational classifications which were listed on the questionnaire. As stated previously, these occupational classifications (Industrial, Business, Health, Agricultural Service, and Public Service) were grouped according to what the employee does, while the industry classifications (Manufacturing, Wholesale, Retail, Services, etc.) were grouped according to where the employee worked.

Table 13 shows a total of 1,156 employees were reported in this industrial occupation classification by

questionnaire respondents. Of this number, 1,131 were men and twenty-five were women. For the occupational classification as a whole, an additional 107 or slightly over 9 percent were being trained in one manner or another by the firms as employee replacements for these jobs. A slightly higher number, 129 or 11 percent, were replaced during 1964, thus there were only twenty-two trained employees who had to be brought in from outside the firms. This assumes that the trainees were always used first as replacements.

Eight smaller groups or families of occupations are now discussed with the following occupations presented in each group.

Group I-1.....Air conditioning, refrigeration, and/or heating technician.

Group I-2.....Automotive technician.

Group I-3.....Chemical technician.

Group I-4.....Foreman--first line supervisor.

Group I-5.....Architectural draftsman, civil and highway technician, and engineering aide.

Group I-6.....Machine design draftsman, drafting and design technician, metallurgical technician, quality control technician, and industrial X-ray technician.

Group I-7.....Electrical technician, electronic technician, and instrumentation technician.

Group I-8.....Miscellaneous other industrial jobs.

For each of these groups is presented the number of firms reporting the various jobs; the number of employees in this jobs, a breakdown between men and women, the number of company trainees, and the replacements required during 1964. Also presented are the present and past growth factors concerning the occupations, the availability of trained workers in the geographical area, and the opinion of the employers concerning the value to them for obtaining new employees if these training programs were established in the Jasper County Junior College.

Air Conditioning, Refrigeration and/or Heating Technician
(Group I-1, Table 13)

Nineteen firms reported a total of seventy-four air conditioning, refrigeration, and/or heating technicians.

All seventy-four of these employees were men. The same firms reported sixteen individuals in their companies who would be available for replacements when they were trained, and that only nine employees were replaced during 1964. The firms, then, are assuring a supply of trained technicians of this type by training present employees or bringing persons in with the intention of giving them the necessary training. Twelve firms reported that there has been no change over the past five years in the number of air conditioning, refrigeration, and/or heating technicians in their firms. Only one reported a decrease, while five reported an increase. For the future period of 1965 to 1970 the tendency was to report a slightly greater need than in the past. No firm expected a decrease. Eight indicated their need would stay the same, and ten stated that there would be an increase in need. The high number of employees being trained in relation to the number of replacements as discussed above may partially be explained by the apparent short supply of trained persons in the area. Twelve employers indicated that the supply was scarce, and only five denoted an adequate supply. There were no firms indicating an over supply of airconditioning, refrigeration and/or heating technicians.

TABLE 13

SUMMARY OF OCCUPATIONAL FACTORS AND EMPLOYER OPINIONS--INDUSTRIAL OCCUPATIONS

Occupations	Number of responses	Number of employees (except trainees)	Number of Employees by sex		Number of trainees in 1964	Trainees as percent of total	Number replacements in 1964	Replacements as percent of total	Employers rating of growth of occupation						Local supply of trained workers			Occupational training as value to employers		
									Past 1960 to 1965 Number Reporting *			Future 1965 to 1970 Number Reporting *			Number Reporting *			Number Reporting *		
			Men	Women					D	NC	I	D	NC	I	S	A	OS	NH	SH	VV
Group I-1																				
Air Cond., refrig., and/or heating tech.	19	74	74	0	16	21.6%	9	12.2%	1	12	5	0	8	10	12	5	0	2	8	8
Group I-2																				
Automotive technician	18	88	88	0	3	3.4%	22	25.0%	1	9	7	1	4	12	12	5	0	1	7	9
Group I-3																				
Chemical technician	9	58	52	6	11	19.0%	5	8.6%	1	4	3	0	7	2	3	4	1	2	3	4
Group I-4																				
Foreman- first supv.	32	254	251	3	6	2.4%	17	6.7%	4	16	11	0	17	13	16	12	1	3	18	11
Group I-5																				
Architectural drafts.	9	26	25	1	1	3.8%	5	19.2%	1	5	3	0	5	4	6	3	0	0	5	4
Civil and Hwy. tech.	5	19	19	0	0	0	2	10.5%	0	3	2	0	3	2	4	1	0	0	5	0
Engineering aide	10	59	59	0	5	8.5%	13	22.0%	0	4	5	0	3	6	8	1	0	0	5	4
Group I-5 total	24	104	103	1	6	5.8%	20	19.2%	1	12	10	0	11	12	18	5	0	0	15	8
Group I-6																				
Machine design drafts.	11	36	36	0	6	16.7%	8	22.2%	0	4	3	0	4	6	4	5	0	0	3	5
Draft. and design tech.	11	71	68	3	16	22.5%	12	16.9%	0	8	3	0	5	6	5	6	0	2	5	4
Metallurgical tech.	3	4	4	0	2	50.0%	0	0	0	3	0	0	2	1	3	0	0	0	0	3
Mechanical technician	18	121	120	1	6	5.0%	9	7.4%	1	9	7	0	7	9	11	5	0	3	10	5
Quality control tech.	5	12	12	0	1	8.3%	1	8.3%	0	2	2	0	3	2	3	1	0	0	0	4
Industrial X-ray tech.	1	15	15	0	3	20.0%	3	20.0%	0	0	1	0	0	1	1	0	0	0	0	1
Group I-6 total	49	259	255	4	34	13.1%	33	12.7%	1	26	16	0	21	25	27	17	0	5	18	22
Group I-7																				
Electrical technician	11	69	69	0	11	15.9%	6	8.7%	0	8	3	0	8	3	4	7	0	2	6	3
Electronic technician	17	79	79	0	8	10.1%	9	11.4%	0	10	6	0	6	9	8	7	1	0	9	7
Instrumentation tech.	4	44	44	0	2	4.5%	0	0	1	2	1	0	2	2	2	2	0	1	2	1
Group I-7 total	32	192	192	0	21	10.9%	15	7.8%	1	20	10	0	16	14	14	16	1	3	17	11
Group I-8																				
Other Industrial jobs	13	127	116	11	10	7.9%	8	6.3%	-	-	-	-	-	-	-	-	-	-	-	-
GROUP TOTALS	-	1156	1131	25	107	9.3%	129	11.2%	10	99	62	1	84	88	102	64	3	16	86	73

* D = Decrease NC = No Change I = Increase S = Scarce A = Adequate OS = Over Supply NH = No Help SH = Some Help VV = Very Valuable

The majority of the employers believed that the Jasper County Junior College could be of help to them in obtaining new employees if this type of training program existed in the college. Sixteen out of eighteen responses indicated that if the college would offer a program which trains for this position, it would help fulfill their needs. Eight of these sixteen signified that the program would be very valuable, and eight indicated that it would be of some help. Only two indicated that it would be of no help.

It can be concluded that for this position of air conditioning, refrigeration, and/or heating technician the employers at present are doing most of their own training but would rather rely on the college to help supply much of this need for new employees.

Automotive technician (Group I-2, Table 13)

There were eighteen firms which reported having automotive technicians among their employees. A total of eighty-eight employees of this type were shown to be employed by these firms, all eighty-eight being men. A comparatively low number, three or 3.4 percent, were on hand in these firms to take over the position in case of a vacancy. Twenty-five percent, or twenty-two of the eighty-

eight had to be replaced during 1964, showing that these firms are not for the most part training their necessary replacements. Table 13 shows that the employers believed that a short supply existed of persons in the area who could do this work. Seventeen firms answered the question concerning supply. Twelve of these indicated a shortage, five designated an adequate supply, with none indicating an over supply of automotive technicians. The majority of these firms also stated that the Jasper County Junior College, assuming they offered a program of this type in the college, could be of at least some help to them in obtaining automotive technicians. Only one firm stated that the college could be of no help, while seven specified "some help," and nine specified "very valuable." As indicated by the reporting firms, the need for automotive technicians appeared to have increased considerably between 1960 and 1965, and will continue to increase between 1965 and 1970. There was only one firm that showed a decrease between 1960 and 1965. Nine reported no change while seven reported an increase. For the period 1965 to 1970, four specified no change, and 12 indicated an increase. At this point the need for training automotive technicians appears high because the turnover is high, the supply relatively scarce,

and apparent increase in growth of the occupation is indicated for the near future, and most of the employers thought that the Jasper County Junior College could be of help to them.

Chemical technician (Group I-3, Table 13)

Nine firms reported a total of fifty-eight chemical technicians. Fifty-two of these were men and six were women. The number of persons on training for this position was slightly over twice the number of replacements during 1964. There were eleven, or 19 percent, on training but only five, or 8.6 percent, replaced. According to these reporting firms the chemical technician is not for the most part in an over-supply. This was shown by the fact that three firms stated the supply to be "short," four "adequate," and one "over-supply." Eight firms had replied to the question concerning the supply of workers but nine answered the question concerning the help that Jasper County Junior College might provide in the training of chemical technicians. Of the nine who commented on this question, two disclosed that the college could be of "no help," three indicated "some help," and four said that it could be "very valuable." Concerning the growth of chemical technicians

as an occupation, one firm reported its need for chemical technicians to have decreased over the past five years, while four designated "no change," and three revealed an "increase." Nine firms answered the question concerning the future growth of this occupation between 1965 and 1970 with seven indicating "no change," and two indicated an "increase."

At the present time, the chemical technicians in the Jasper County Junior College service area are apparently being trained in adequate numbers by the companies which employ this type of technician, but it can be concluded that several of these firms would like to transfer some of this training to the Jasper County Junior College because they believe that the college could be of "very valuable" help in their obtaining of new employees.

Foreman--First line supervisor (Group I-4, Table 13)

A total of thirty-two employers considered some form of post-high school education as necessary for the position of foreman--first line supervisor. These firms reported a total of 254 first line supervisors, only three of whom were women. The percentage of persons on training and the percentage of replacements during 1964 were lower

than for most other occupations reported in this study. Only six persons, or 2.4 percent of the total, were being trained to step into the first line supervisor's job. The turnover or replacement rate during 1964 was slightly less than 7 percent. Although the percentage trainees in these firms was small and the turnover small, the firms expressed the view that the local supply of trained workers was for the most part scarce. Sixteen firms checked the column stating that the available foremen in the area were scarce. Twelve stated that foremen were adequate and one employer stated that there was an over-supply of foremen. Apparently the firms are expecting to have to train this type of individual when the position opens. All thirty-two employers gave their opinion as to the help that might be given them by the Jasper County Junior College through programs of this type. For the most part their answers seem to convey the thought that the college could at least partially aid them in foreman training. Only three specified that the college could be of "no help," while eighteen checked "some help," and eleven checked "very valuable." There were several comments from the firms concerning this question of training foremen. These comments indicate that the training for this position will probably have to be done very close to

the time that the individual takes over the position. This would rule out the possibility of having formalized training for recent high school graduates due to the fact that they would not likely be the ones who immediately take over the foreman positions. Also, the foremen listed on the questionnaire by the firms came from many different types of businesses, thus the type of training given them would have to be of a nature that applies to all types of supervisory positions. The possibility of night school programs for leadership training of present employees was mentioned by several firms.

In addition to the comments concerning the help that the firms might receive from the college, it may be concluded that the college might be of help to the businesses and industries in the area by the fact that the past and future growth of the occupation appears promising. During 1960 to 1965 there were only four firms that decreased the number of this type of supervisor, while sixteen firms maintained the same number, and eleven increased the number of supervisors. None of these firms expect to decrease the number of supervisors between 1965 and 1970. Seventeen employers expect their need for supervisors to stay the same

while thirteen expect an increased need for persons to fill these positions.

Architectural draftsman, civil and highway technicians, and engineering aides (Group I-5, Table 13)

These occupations have enough similar requirements in the Jasper County Junior College service area to place them in a group for discussion as a common family of occupations. They are similar because of the mathematics background, similar drawing course requirements, and the fact that most of the positions obtained by these graduates contain a need for training in estimating construction costs.

A total of twenty-four respondents reported 104 employees in this group. All but one, or 103, were men. The one woman reported was an architectural draftsman. During the year 1964, only six persons were being trained to take over as replacements for any of the 104 individuals who might leave their positions. This is a training rate of approximately 5.8 percent. Table 13 shows that for these three occupations the replacements considerably exceeded the number in training. The 24 responses revealed that twenty persons had to be replaced during 1964. This is a replacement rate of 19.2 percent or over three times the training rate. The civil and highway technician occupation

apparently had a less percentage turnover than the other two occupations.

The growth of these occupations was about the same between 1960 and 1965. During this period only one firm indicated a decrease in need for these types of employees. This exception was by one of the nine firms employing architectural draftsmen. Twelve revealed "no change" and ten indicated increase in need occurred. The firms were slightly more optimistic for the period 1965 to 1970. None of them specified that there would be a decrease in the positions in this group, eleven marked "no change," while twelve suggested an increase would probably be forthcoming. A total of twenty-three out of the twenty-four respondents provided answers to these last two questions. The same number, twenty-three, answered the question concerning the local supply of trained workers for these positions. Eighteen of the twenty-three believed that the supply was scarce, five suggested that it was adequate, and no responses were given concerning an over-supply. There appears, then, to be a high level of agreement among respondents as to the scarcity of these types of employees.

If a program of this type were augmented in the Jasper County Junior College it would be of "some help"

according to fifteen of the firms in their need for securing trained employees of this group. This is nearly two-thirds of the responses to the question. The other third, or eight employers, stated that this type of training would be very valuable to them.

It appears that a program for training and/or upgrading architectural draftsmen, civil and highway technicians, and engineering aides in the Jasper County Junior College would have the support of the firms in the area.

Machine design draftsman, drafting and design technician, metallurgical technician, mechanical technician, quality control technician, and industrial X-ray technician
(Group I-6, Table 13)

This next family of occupations contains six jobs as listed on the questionnaire. Hydraulics technician and industrial technician, which were listed on the questionnaire and would have been part of this group, could not be included in the summary because no responses were received relating to these two occupations. The writer and the advisory committee members believed that at least one or two companies in the area employed hydraulic and industrial technicians. When none was reported on the questionnaires a check was made to see why. It was found that the persons working as hydraulic and industrial technicians were

required to have a college degree. The hydraulic or industrial technician functions were only a part of the total requirements of the positions.

A total of forty-nine respondents reported having this type of position in their firms. They recorded 259 employees in the jobs reported. Two-hundred-and-fifty-five were men and four were women. Three of these women were in the drafting and design technician occupation.

A training rate of slightly over 13 percent appeared in this group of occupations. Thirty-four employees were being trained in 1964 to replace persons for the 259 positions reported. The training rate varied considerably among occupations within the group. Metallurgical technicians had the largest training rate but the numbers involved were very small. Drafting and design technician replacements were larger in numbers and showed a 22.5 percent rate. The least was mechanical technician which showed a 5 percent training rate. A comparison of this training rate with the total replacements showed that there were nearly the same number of employees on training as were needed for replacements during 1964. The overall replacement rate for the 259 jobs was 12.7 percent.

Taken collectively, the data received concerning occupational growth between 1960 and 1965 revealed considerable stability of employee numbers in these occupations. Out of forty-three who answered this question, one said there was a decrease in employment rate, twenty-six indicated that their need stayed the same, and sixteen denoted an increase for employees in this group of occupations.

Somewhat more optimism was indicated by forty-six respondents in answering the question concerning occupational growth of these occupations for the period 1965 to 1970. None of the firms marked "decrease," twenty-one indicated "no change," and twenty-five responded by saying that the need for employees would "increase."

A majority of the firms were in agreement that the local supply of trained workers was scarce. Forty-four firms responded to this question with twenty-seven indicating a scarcity, and seventeen saying the supply was adequate. This scarcity may help explain why the companies are training as many persons for the positions as are necessary for replacements.

A total of forty-five firms answered the question concerning the value to them of programs of this type in the Jasper County Junior College. A few, five, said that

the college could be of no help to them, eighteen said that it could be of some help, and twenty-two thought that it would be very valuable.

The responses show that for this group of occupations the firms are training most of their own employees. This is undoubtedly necessary because there are practically no facilities in the area to train or assist in the training for most of these types of jobs. The businesses would apparently like to have the college take over at least part of the training functions as indicated by their responses.

Electrical technician, electronic technician, and instrumentation technician (Group I-7, Table 13)

These positions have been grouped together because of the common background in electronics and electrical subjects necessary in carrying out the occupational functions. Taking this group as a whole, there were thirty-two respondents who reported a total of 192 individuals in these positions. All 192 were men. Again, as is true with the previous group of occupations, the training rate is slightly higher than the number of replacements required in 1964. There was a total of twenty-one, or nearly 11 percent, trained during that year and only fifteen, or slightly less than 8 percent, replaced during the same year. Here

again, the firms are training their own employees for these types of occupations. The responses varied considerably between occupations within the group. Nearly twice as many electrical technicians were being trained as were needed for replacements. The number of electronic technicians being trained nearly equaled the replacements for that occupation.

Twice as many firms reported that the need for these types of technicians did not increase over the period 1960 to 1965 as reported that it did increase. Twenty said that there was no change in their need, while ten stated that the need increased. The period 1965 to 1970 was viewed with optimism by these same respondents. Sixteen respondents said that they could see no change in the upcoming period while fourteen said that there would be an increase between 1965 and 1970.

The local supply of trained workers does not appear to be as scarce as it has been for some of the other groups of occupations in the industrial classification. Fourteen out of thirty-one respondents said that the supply was scarce while sixteen indicated it to be adequate. One firm said that there was an over-supply. A majority of the firms, or seventeen out of thirty-one, said that if the Jasper

County Junior College offered a program of this type it could be of some help to them, with eleven stating that it could be very valuable. Thus, twenty-eight out of thirty-one indicated an affirmative response to the question. Only three firms indicated that it would be of no help.

Miscellaneous other industrial jobs (Group I-8, Table 13)

A total of thirteen firms reported 127 employees in miscellaneous industrial jobs. One hundred and sixteen of these jobs were held by men and eleven by women. Due to the variety of jobs and the small numbers of employees involved, it would be difficult to make meaningful statements regarding most of the positions. However, the representative of one trucking firm added the occupation of tractor-truck driver to the list on the questionnaire and indicated that special training was desired by the firm for fifty of their drivers. This employer also indicated that their need for truck drivers had increased over the past five years, and that it would continue to increase over the next five years. He also stated that the supply of persons trained as tractor-truck drivers was scarce and that if such a program were implemented in the curriculum

of the Jasper County Junior College it would be very valuable to them.

The occupation of cabinet maker was listed by one employer who reported twelve persons in this occupation. This employer also believed the supply of persons trained as cabinet makers was scarce and that the Jasper County Junior College could be very valuable to them in supplying adequately trained persons if such a program were offered.

Another employer who employs eight plumbers added this job to the list of occupations and believed that the college could be of some help in training for this occupation. Other occupations listed and the number of employees reported were: arc and gas welders, 1; electric motor rewinder, 1; platers, 10; general carpenter, 3; methods and work standards, 5; various assembly line workers, 33; cereal chemist, 1; glass blower, 1; sheet metal tinner, 1; and inventory control, 1. No attempt was made to define these occupations.

Business Occupations Reported

This is the second of the occupational classifications listed on the questionnaire. There were eighteen

jobs listed in this classification. For purposes of analysis these were formed into seven smaller groups or families of occupations. (See Table 14)

Group B-1.....Accountant, business management, outside salesman (except agriculture), real estate, insurance and/or finance, retail management and buying, and sales manager.

Group B-2.....General secretary, legal secretary, and general office.

Group B-3.....Business data processing, business machine operator.

Group B-4.....Advertising and/or commercial art, merchandising and display.

Group B-5.....Food technology, hotel and motel employees

Group B-6.....Printing

Group B-7.....Other business jobs

Taking the classification as a whole 1,560 employees were listed by employers in these occupations, 846 of whom were men and 714 women. In addition to this total another

149 persons were reported as being trained during 1964 in these business jobs. The 149 persons on training compared to the total of 1,560 persons in business jobs represents a training rate of 9.6 percent. The total number of replacements during 1964 was 254 for a replacement rate of 16.3 percent. The difference between 254, the total number replaced, and 149, the total number trained by these companies, is 105, which represents the number of employees that the employers had to hire outside their own company during 1964. Considering this difference by percentages, employers replaced from outside the company approximately 7 percent of their employees who were reported in business jobs. This assumes trainees were used first. This 7 percent replaced from outside the company is much higher than the approximate 2 percent found to be needed by those reporting industrial type occupations.

Accountant, business management, outside salesmen, real estate, insurance and/or finance, retail management and buying, and sales manager (Group B-1, Table 14)

These occupations were listed 257 times by the firms for a total of 806 employees. This number was fairly evenly divided between men and women in the occupations of accountants, real estate, insurance, and finance, but men

dominated the remainder. As would be expected, the number of women in all of the business occupations is much greater than appeared in the industrial groupings.

Eighty individuals were being trained during 1964 by these firms to fill vacant positions that might occur. This produces a training rate of nearly 10 percent. The replacement rate was considerably more than the training rate. That year, there were 121 turnovers, making a 15 percent replacement rate. Within this group, two of the management positions (sales management and retail management) showed a considerably lower replacement rate than did the other occupations. The highest turnover was in the occupation of outside salesman.

Two hundred and thirteen responses were received concerning the local supply of trained workers. One hundred and eighteen believed that the supply was scarce and ninety-four indicated an adequate supply of these workers existed in the local area. Only one of the firms specified an oversupply. Two hundred and sixteen firms responded to the question concerning the value to them of training being offered in the Jasper County Junior College for this group of business jobs. Twenty-one returns stated that a program of this type would not help their firm in obtaining new

employees, ninety-four stated that it would be of some help, and 101 indicated that it would be very valuable to them. Since the college already has a limited program in this area of study, some of the answers here may have reflected the opinions of the employers concerning the present programs.

The comments received on the questionnaires were significant for this group. Several of the respondents indicated that the type of classes desired by them would be for upgrading and training present employees through the night division of the college. Through this means, many of the firms' trainees, plus the individuals presently in the occupations of accountant, business management, outside salesmen, real estate, insurance, finance, retail management, and sale management could keep up to date in their field.

Has the need for employees in this group been increasing in recent years in the Jasper County Junior College service area? According to the response to the question on past growth which related to the years 1960 to 1955, the majority of the respondents stated that there was no change in employee numbers during that period. The "no change" responses totaled 161, while five indicated a decrease, and fifty-eight showed an increase in the number of employees.

TABLE 14

SUMMARY OF OCCUPATIONAL FACTORS AND EMPLOYER OPINIONS--BUSINESS OCCUPATIONS

Occupations	Number of responses	Number of employees (except trainees)	Number of Employees by sex Men	Women	Number of trainees in 1964	Trainees as percent of total	Number replacements in 1964	Replacements as percent of total	Employers rating of growth of occupation Past 1960 to 1965 Number Reporting * D	NC	I	Future 1965 to 1970 Number Reporting * D	NC	I	Local supply of trained workers Number Reporting * S	A	OS	Occupational training as value to employers Number Reporting * NH	SH	VV
Group B-1																				
Accountant	79	163	86	77	11	6.7%	26	16.0%	2	53	18	0	48	21	26	41	0	5	29	0
Business management	33	71	54	17	12	16.9%	10	14.1%	0	26	3	0	18	10	17	12	0	3	13	12
Outside salesmen (ex.Ag.)	58	282	277	5	25	8.9%	51	18.1%	2	27	22	0	20	29	32	17	1	6	21	25
Real Est., Ins., Finance	27	169	89	80	22	13.0%	26	15.4%	0	15	9	0	10	17	15	10	0	2	14	9
Retail Mgt. and Buying	12	58	43	15	8	13.8%	3	5.2%	0	10	0	0	7	3	8	3	0	1	3	6
Sales manager	48	63	58	5	2	3.2%	5	7.9%	1	30	6	0	28	7	20	11	0	4	14	16
Group B-1 total	257	806	607	199	80	9.9%	121	15.0%	5	161	58	0	131	87	118	94	1	21	94	101
Group B-2																				
General secretary	101	276	10	266	25	9.1%	59	21.4%	2	74	16	0	56	29	29	55	3	4	39	42
General Office	9	56	11	45	3	5.4%	7	12.5%	1	4	3	0	5	3	3	5	0	0	6	2
Legal secretary	9	15	4	11	1	6.7%	4	26.7%	1	7	1	0	6	3	8	0	0	0	3	6
Group B-2 total	119	347	25	322	29	8.4%	70	20.2%	4	85	20	0	67	35	40	60	3	4	48	50
Group B-3																				
Business Data proc.	8	28	20	8	2	7.1%	2	7.1%	0	1	4	0	2	3	6	1	0	0	2	5
Business mach. oper.	29	94	20	74	15	16.0%	15	16.0%	2	17	7	0	16	8	9	14	1	3	13	9
Group B-3 total	37	122	40	82	17	13.9%	17	13.9%	2	18	11	0	18	11	15	15	1	3	15	14
Group B-4																				
Adv. and Commercial art	11	27	23	4	1	3.7%	4	14.8%	1	8	2	0	8	3	4	5	0	0	7	3
Merchandising and display	12	49	39	10	5	10.2%	11	22.4%	0	6	3	0	6	4	5	6	0	0	5	6
Group B-4 total	23	76	62	14	6	7.9%	15	19.7%	1	14	5	0	14	7	9	11	0	0	12	9
Group B-5																				
Food technology	1	3	1	2	2	66.7%	1	33.3%	0	0	1	0	1	0	1	0	0	0	1	0
Hotel and Motel empl.	1	73	32	41	4	5.5%	16	21.9%	0	0	1	0	0	1	1	0	0	0	0	1
Group B-5 total	2	76	33	43	6	7.9%	17	22.4%	0	0	2	0	1	1	2	0	0	0	1	1
Group B-6																				
Printing	5	24	16	8	2	8.3%	1	4.2%	0	5	0	0	4	1	4	1	0	0	1	3
Group B-7																				
Other business jobs	19	109	63	46	9	8.3%	13	11.9%	-	-	-	-	-	-	-	-	-	-	-	-
GROUP TOTALS	-	1560	846	714	149	9.6%	254	16.3%	12	283	96	0	235	142	188	181	5	28	171	178

* D = Decrease NC = No Change I = Increase S = Scarce A = Adequate OS = Over Supply NH = No Help SH = Some Help VV = Very Valuable

The firms reporting were optimistic about the future growth of these occupations with responses showing a general increase in the need for additional employees. From 1965 to 1970 no change will probably occur according to 131 responses, but an increase will probably occur according to eighty-seven responses. None of the answers indicated that there would be a decrease in need for this type of employee over this future five year span.

General secretary, legal secretary, and general office (Group B-2, Table 14)

One hundred and nineteen responses were received for this group of occupations with a majority being for the position of general secretary. The total employees listed from the 119 responses were 347. The general office position was written in by nine firms as it did not appear on the original questionnaire. The firms reporting the position of "general secretary" desired to have their employees perform duties such as bookkeeping, and certain types of clerking, in addition to secretarial work. They therefore desired to have a distinction in the job titles.

As would be expected, a large majority of the people occupying these positions were women, with 322 reported as women and only twenty-five as men.

For these three types of position, general secretary, legal secretary, and general office, there were twenty-nine persons being trained by the employers. This produces a training rate of 8.4 percent which is considerably below the replacement rate of 20.2 percent. It stands to reason that there would be a wide gap between the training rate and the replacement rate. It would be difficult to give the basic training such as typing and shorthand, for secretaries in the setting of an ongoing business. Also, this type of training transfers from the classroom to the office easier than many other training programs.

A total of 109 responses were received concerning the 1960 to 1965 growth in the general secretary, general office, and the legal secretary positions. Four said that their need for people in these positions had decreased, the majority, or eighty-five, stated that it had stayed the same, and twenty stated that it had increased. In reporting the future growth for these occupations no employers believed that their need would decrease during the 1965 to 1970 five-year period. Sixty-seven said that it would stay the same, and thirty-five indicated that it would increase. Thus, the optimism for growth was greater for the next five year period than was indicated to have actually existed

during the past five years. In general, it appears that the increase for these secretarial and general office positions will not be as great as in many of the other types of positions, but again, the replacement rate is high which keeps the need relatively high.

The responses from employers did not show as large a number of firms reporting a scarcity of trained persons for these positions as did some of the other families of occupations. Forty responses were counted in the "scarce" category, while sixty responded in the "adequate" column on the questionnaire. Only three said that there was an over-supply of persons for these jobs. A total of 103 responses were received for this question.

One hundred and two responses were received on the question concerning the value of training programs for new employees in these occupations. Four of these responses said that the college could be of no help to them, forty-eight said that it could be of some help, and fifty believed that these programs could be very valuable.

The general secretary's position dominates this group and would undoubtedly be the major part of any expansion of this type of program in the college, but comments from the legal profession indicated that they would be

willing to cooperate on programs in training secretaries for legal positions. It appears that this could be done on a cooperative type work program where the student takes classes in the school and then works part time in a legal office.

Business data processing, and business machine operators (Group B-3, Table 14)

These occupations are similar in many basic considerations, but due to the difference of equipment used in the performance of the job the occupations are discussed separately. For example, the business data processing training requires considerable investment in data processing machines.

Several business data processing positions were found in the Jasper County Junior College service area. Eight firms reported a total of twenty-eight employees in this occupation. Twenty of these were men and eight were women. Both the trainees and the total employees replaced during 1964 were the same number, two, or approximately 7 percent. Taking this information into account it appears that during 1964 the firms were training their own individuals as fast as replacements were necessary. This training by companies may result from a scarcity of trained employees.

Six of seven answers to this question concerning the local supply of trained workers were in the "scarce" column and one was in the "adequate" column. Would a program of this type, if offered in the Jasper County Junior College, help these employers in obtaining new employees trained in data processing? According to two, it would be of some help, with five indicating it would be very valuable, and there were no firms which gave a negative response to the question. Therefore, even though the businesses are training their replacements at the present time, it appears that they would like to see the college be more active in this field. Also there appears to be a growth in the business data processing occupation in Jasper County. During 1960 to 1965 no firms reported fewer individuals holding this data processing position, one firm had not changed, while four firms had increased the number of data processing employees. Predictions for the years 1965 to 1970 again show no decrease in the data processing occupation numbers, with two indicating no change, and three indicating that data processing employees would increase.

The number of firms reporting business machine operator position employees numbered more than three times those designating business data processing employees.

Twenty-nine firms reported ninety-four employees in this occupation. Twenty of these employees were men and seventy-four were women. Thus the women considerably outnumbered the men as business machine operators. As with the business data processing, the number of trainees exactly offset the number of replacements needed in 1964 by the reporting firms, but with fifteen reported being trained and fifteen reported being replaced as compared with two each in the business data processing occupation.

Twenty-four respondents commented on the local supply of trained business machine operators. Nine out of twenty-four said that the supply was scarce, fourteen said that it was adequate, and one firm stated that there was an over-supply of business machine operators. If the Jasper County Junior College offered a program of this type it would be of no help to three of the employers, it would be of some help to thirteen of them, and it would be very valuable to nine firms. A total of twenty-five firms answered this last question concerning the value to them of business machine operator training in the Jasper County Junior College.

Twenty-six firms commented on the past growth from 1960 to 1965, two that their business had decreased in the need for business machine operators, seventeen indicated

no change, and seven denoted an increased need concerning the future growth of the business machine operator occupation. No firms were pessimistic enough to predict a decline in need for business machine operators for the years 1965 to 1970, but sixteen indicated their needs would probably stay the same. Eight predicted that the need would increase over this period.

Advertising, commercial art, merchandising, and display (Group B-4, Table 14)

Twenty-three respondents listed a total of seventy-six employees in the occupations of advertising, commercial art, and merchandising and display. Sixty-two were men and 14 women. Companies reported that six employees were being trained in 1964 to fill vacant positions in this group. They also reported eleven replacements during 1964. This brought the total replacement rate slightly below 8 percent. Within this percentage there was a much higher replacement for merchandising and display jobs than for advertising or commercial art jobs.

Twenty responses were received on the question concerning the local supply of advertising, commercial art, and merchandising and display workers with nine stating that the supply was scarce and eleven stating it was adequate.

If a program to train advertising, commercial art, and merchandising and display employees were offered by the Jasper County Junior College, twelve of the respondents said that it could be of some help to them. Nine indicated that it would be very helpful.

Fourteen out of twenty respondents to the question concerning past growth of the occupations predicted that between the years 1960 and 1965 no change would occur in the need for advertising, commercial art, and merchandising and display employees. Five predicted an increase in these types of occupations within their firms, and one predicted a decrease. Fourteen also predicted that there would be no change in need for these employees for the years 1965 to 1970 while seven predicted an increase, making a total of twenty-one responses to this question.

Food technology and hotel and motel employees (Group B-5, Table 14)

The response to this type of occupation was dissappointing, with only two firms replying, one in each occupation. Since questionnaires were sent to businesses that employed people in food technology, and hotel and motel occupations, a check was made of several restaurants, hotels, and motels to ascertain why such a small number of

questionnaires were returned. Interviews of several restaurant managers and other food establishment persons included in the original survey revealed that these persons believed high school, plus a certain amount of on-the-job training, to be sufficient education for food establishment, hotel and motel employment. Also several employers stated that the wages received by most of the employees in these occupations did not justify an investment in further education. Those firms, such as hospitals, which employed trained food technologists, required their employees to have college degrees and did not have a place for persons with an education in-between high school and four-year college degrees as asked for on the questionnaire.

The lone respondent from a hotel and motel establishment revealed a large operation in which seventy-three people were employed. The employer responding made several comments on his questionnaire emphasizing the great need for hotel and motel type training in the area. In fact, he volunteered to help start and even help teach, if necessary, courses in the Jasper County Junior College to train employees for the hotel and motel business. As mentioned above for food technology, this enthusiasm was not shared by a majority of the employers. The majority of opinions

received indicated that there was apparently no place in their business for the person with training at the post-high school level but below the baccalaureate degree.

Printing (Group B-6, Table 14)

Only five respondents in the Jasper County Junior College service area stated that they employed persons who came under the occupational field of printing.

Sixteen of the twenty-four employees reported by these firms were men, and eight were women. In addition to the twenty-four employees, two were on training to take over the positions, but only one was replaced during 1964. The supply of trained workers to take over these positions apparently was not adequate as four firms of the five stated that the supply was scarce. One employer stated that the supply was adequate. Considering the growth factors, all five firms were in agreement that during 1960 to 1965 there was no increase in their need for printers. For the next five year period, 1965 to 1970, four of the five firms again stated that there would be no change in need for employees in printing occupations; but one indicated an increased need for printers. Four of the five firms responded to the question asking if a printing program implemented in

the Jasper County Junior College would help them in their need for new employees. Three out of four stated that the program could be very valuable, but it would appear that a program of this type would have to be implemented for replacement purposes or upgrading present employees only, since the firms did not generally state that their need for printers would increase significantly during the five year period 1965 to 1970.

Other Business Jobs (Group B-7, Table 14)

Nineteen firms added other business jobs to the questionnaire, therefore indicating their desire to employ persons with more than a high school education in these positions. None of the jobs were listed by more than one firm, but some of them involved a considerable number of employees. Thirty-four of these employees from six firms may be grouped into the news media occupations as reporters for newspapers, reporters and announcers for radio stations, and television announcers and camera operators. However, enough difference exists in these occupations and the numbers for each are small that no attempt will be made to analyze them. One financial firm listed twenty-one employees as general clerks and tellers. A land title company

listed twenty employees as needing special training in land title work beyond the high school level training, but they also commented that they did not believe that the Jasper County Junior College could be of any help to them. Some of the other jobs listed were: embalmer, tour agent, distributor, key punch operator, and office equipment repairman.

Health Type Occupations Reported

This occupational classification includes a total of thirteen jobs and is reported here in six groups as shown below and on Table 15.

Group H-1.....Dental office assistant, medical office assistant, and optometric office assistant.

Group H-2.....Dental hygeienist

Group H-3.....Nurses aide and practical nurse

Group H-4.....Medical lab technician and medical X-ray technician

Group H-5.....Medical secretary and dental secretary

Group H-6.....Optical technician

Ten occupations were listed on the questionnaire. The occupation of nurses aide was a write-in position.

A total of 297 employees in the health occupations needed post-high school training below a baccalaureate

degree according to the respondents to the questionnaire. A majority of these health employees, 273, were listed as women. Only twenty-four men were in these occupations.

The number of trainees reported and the number of replacements reported were essentially the same. The training rate was 16.5 percent and the replacement rate was 16.2 percent. However, there was a considerable variation in rates for individual occupations.

Still considering the field as a whole, seventy-four of ninety-five respondents to the question concerning the local supply of health workers said that the supply was scarce. Twenty-one responses indicated an adequate supply in certain of these health occupations but no one responded by saying that there was an over-supply. One-hundred responses were received to the question: "If training for this position were given in the Jasper County Junior College, would it help in fulfilling your needs for new employees?". The majority of respondents said that it would be very valuable. Fifty-nine responded in this manner. Another thirty-three stated that it would be of some help, and only eight said that it would be of no help. Thus, an overwhelming majority (ninety-two out of one hundred responses) said that the college could be of some or valuable help in training new employees for these occupations.

TABLE 15

SUMMARY OF OCCUPATIONAL FACTORS AND EMPLOYER OPINIONS--HEALTH, AGRICULTURAL SERVICE, AND PUBLIC SERVICE OCCUPATIONS

Occupations	Number of responses	Number of employees (except trainees)	Number of Employees by sex		Number of trainees in 1964	Trainees as percent of total	Number replacements in 1964	Replacements as percent of total	Employers rating of growth of occupation						Local supply of trained workers			Occupational training as value to employers		
									Past 1960 to 1965			Future 1965 to 1970								
									Number Reporting *			Number Reporting *			Number Reporting *			Number Reporting *		
			Men	Women					D	NC	I	D	NC	I	S	A	OS	NH	SH	VV
HEALTH OCCUPATIONS																				
Group H-1																				
Dental office assist.	8	9	0	9	1	11.1%	3	33.3%	0	5	2	0	5	3	6	2	0	0	2	6
Medical office assist.	30	40	4	36	1	2.5%	3	7.5%	2	20	3	0	19	4	17	7	0	1	10	16
Optometric office assist.	4	6	0	6	0	0	0	0	0	3	1	0	3	1	3	1	0	1	0	3
Group H-1 total	42	55	4	51	2	3.6%	6	10.9%	2	28	6	0	27	8	26	10	0	2	12	25
Group H-2																				
Dental Hygenist	5	4	0	4	1	25.0%	0	0	0	1	2	0	2	2	5	0	0	1	1	2
Group H-3																				
Nurses Aide	1	22	0	22	0	0	10	45.5%	0	1	0	0	0	1	1	0	0	0	0	1
Practical nurse	14	141	3	138	29	20.6%	16	11.3%	1	7	2	0	8	3	7	4	0	1	5	3
Group H-3 total	15	163	3	160	29	17.8%	26	16.0%	1	8	2	0	8	4	8	4	0	1	5	4
Group H-4																				
Medical lab. technician	11	16	4	12	5	31.3%	5	31.3%	0	3	3	0	4	2	5	2	0	1	3	4
Medical X-ray technician	4	6	4	2	2	33.3%	0	0	0	2	1	0	2	1	3	1	0	0	3	1
Group H-4 total	15	22	8	14	7	31.8%	5	22.7%	0	5	4	0	6	3	8	3	0	1	6	5
Group H-5																				
Medical secretary	31	37	0	37	4	10.8%	6	16.2%	0	20	4	0	20	4	20	4	0	1	8	18
Dental secretary	5	5	0	5	2	40.0%	1	20.0%	0	0	3	0	1	2	3	0	0	0	1	3
Group H-5 total	36	42	0	42	6	14.3%	7	16.7%	0	20	7	0	21	6	23	4	0	1	9	21
Group H-6																				
Optical technician	5	11	9	2	4	36.4%	4	36.4%	0	3	2	0	3	1	4	0	0	2	0	2
GROUP TOTALS	-	297	24	273	49	16.5%	48	16.2%	3	65	23	0	67	24	74	21	0	8	33	59
AGRICULTURAL SERVICE OCCUPATIONS																				
Group A-1																				
Sales and service tech.	7	22	22	0	1	4.5%	4	18.2%	0	2	3	0	2	2	4	1	0	0	3	1
Group A-2																				
Landscape and nursery tech.	2	6	6	0	1	16.7%	1	16.7%	0	2	0	0	1	1	2	0	0	0	0	2
Group A-3																				
Veterinary assistant	1	4	3	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	1
GROUP TOTALS	-	32	31	1	2	6.3%	5	15.6%	0	4	4	0	4	3	6	2	0	0	3	4
PUBLIC SERVICE OCCUPATIONS																				
Group P-1																				
Law enforcement	1	9	9	0	3	33.3%	3	33.3%	0	1	0	0	1	0	1	0	0	0	1	0
Group P-2																				
Fireman	2	28	28	0	6	21.4%	6	21.4%	0	1	1	0	1	1	2	0	0	1	1	0
GROUP TOTALS	-	37	37	0	9	24.3%	9	24.3%	0	2	1	0	2	1	3	0	0	1	2	0

* D = Decrease NC = No Change I = Increase S = Scarce A = Adequate OS = Over Supply NH = No Help SH = Some Help VV = Very Valuable

Dental office assistant, medical office assistant, and optometric office assistant (Group H-1, Table 15)

A total of 42 respondents indicated fifty-five employees as being in positions of dental, medical, or optometric office assistants. Women dominated this group of occupations with fifty-one out of the fifty-five. The training rate was small, only 3.6 percent. The replacement rate varied considerably between the three occupations with an average rate of nearly 11 percent. Surprisingly enough, the respondents did not indicate a large change in the need for these office assistant type employees during the period 1960 to 1965. Twenty-eight out of thirty-six respondents indicated that there had been no change over this period, while six said there had been an increase and two indicated a decrease. The future growth over the period 1965 to 1970 was nearly the same as for the past five years. Twenty-seven indicated no change would likely occur and only eight said that it would increase.

The majority of the responses, twenty-six out of thirty-six, indicated a scarcity of trained workers for dental, medical, and optometric office assistant jobs with the other ten saying that the supply was adequate. Two firms then indicated that the college could be of no help

to them, but twelve out of twenty-five responded that it could be of some or valuable assistance. Only two firms stated that the college could be of no help.

Dental hygienist (Group H-2, Table 15)

Five dentists reported having a dental hygienist in their office. One of these five did not report any number but the remainder of the section on dental hygienist was filled out, thus indicating that this lack of the number of dental hygienists employed by this office must have been an oversight. Only four are counted and used here since this was the actual number reported on the questionnaire.

The respondents agreed that a scarcity of dental hygienists existed in the area. All five stated that the supply was scarce. Opinions varied on the answers to the questions on past and future growth of the occupation, and the value of this type of training if the service were provided as part of the curriculums of the Jasper County Junior College.

Nurses aide and practical nurse (Group H-3, Table 15)

The nurses aide position was not on the original questionnaire but was added by a hospital. Due to the

short duration of training for this nurses aide position, it had not been considered as part of this questionnaire, but is included in the summary because of the belief by this hospital that the college could be of valuable help in training for the position.

A total of fifteen respondents listed 163 employees in these two occupations. Only three out of the 163 were men. The training rate shown by these fifteen responses averaged 17.8 percent but all of the training was being carried on for practical nurses, and the training rate for this occupation alone was over 20 percent. The nurses aide position training is apparently not obtained in the hospital that reported to have this type of position. Replacements in these jobs averaged 16 percent with the nurses aide having the largest replacement rate.

There was no great increase in employees in nurses aides or practical nurse positions during the 1960 to 1965 period. Eight out of eleven respondents indicated no change. Two indicated an increase and one a decrease. The respondents were only slightly more optimistic for an increase during the period 1965 to 1970. There were still eight responses indicating no change but four stated an increase in

need for nurses aides and practical nurses would probably occur. A total of twelve responses were received on this question. Twelve answers were also received concerning the local supply of nurses aides and practical nurses. Eight of these said that it was scarce and four indicated that the supply was adequate. The responses concerning the help that might be given by the Jasper County Junior College varied in degree but nine out of ten responses indicated that the college could be of "some" or valuable help in their need for nurses aides and practical nurses.

Medical laboratory technician, X-ray technician (Group H-4, Table 15)

A total of twenty-two employees were listed among the fifteen responses received for these two occupations. Eight were men and fourteen were women. The majority of these jobs were reported as being medical lab technicians.

The training rate and the replacement rate were 31.8 percent and 22.7 percent respectively for these occupations. During 1964 the employers had available seven trainees to take the place of any of the twenty-two who might cease to be in the position. Only five had to be replaced during the year. Therefore, more employees were being trained than were required for replacements.

Nine responses were received on the questionnaire relative to the past growth of medical laboratory and X-ray technicians. Five of the nine respondents stated that their need for medical laboratory and X-ray technicians had stayed the same over the last five year period. Four stated that it had increased. For the period 1965 to 1970, six firms predicted that the need would not increase but would stay the same. An additional three said that it would increase.

The local supply of trained workers in the area was scarce according to eight employers and adequate according to three. Eleven responses were received on this question.

Twelve employers responded to the question which involved the help that the college might be in supplying new employees. One of the twelve believed that the college could be of no help, six said that it could be of some help, and five said that it could be very valuable in supplying new employees.

Medical secretaries and Dental secretaries (Group H-5, Table 15)

These secretarial positions were separated from the other secretarial positions so that they could be analyzed with the health occupations. The college advisory committee believed at the outset that medical and dental secretaries

were in short supply and that it would be valuable for the college to know about the shortage if it attempted to design programs for the health occupations. However, in actual practice much of the training is the same as for general secretaries.

A total of forty-two medical and dental secretaries were reported by thirty-six respondents to the question. This number averages slightly over one per office or establishment. All of these secretaries were women.

The number being trained for the positions and the number replaced during 1964 were approximately the same. Six were on training and seven were replaced. An approximate two-thirds of the respondents, or twenty, stated that their need for medical or dental secretaries had not changed from 1960 to 1965 and the other one-third, or seven, said that it had increased. Twenty-one employers said that their need for medical and dental secretaries would probably not change in the next five years and six said the need would increase. There were no replies which indicated the need had decreased during the period 1960 to 1965 or would decrease during the period 1965 to 1970.

An even greater majority of the employers were in agreement on the local supply of trained workers for medical

and dental secretary positions. Twenty-three out of twenty-seven respondents said that the supply was scarce. The remaining four said that it was adequate, while none said the supply was excessive.

Again, a majority of the respondents agreed that the Jasper County Junior College could be of help to them if new employees could be trained in a program through the college. Twenty-one stated that a program for training medical and dental secretaries would be very valuable to them. Another nine said that it would be of some help, while only one stated that it would be of no help. Several comments were received on the questionnaires concerning the training of medical and dental secretaries. A willingness to cooperate with the college in setting up and operating a program was expressed frequently.

Optical technician (Group H-6, Table 15)

The last occupation to be discussed in this classification is the optical technician. This occupation, which generally has to do with the grinding of glasses and the fitting of glasses into frames, was reported by five firms in the Jasper County Junior College service area. A total of eleven employees were reported by these five firms. Nine

of the optical technicians were men and two were women. A high replacement rate during 1964 was reported by the employers. Four optical technicians were replaced during that year and also four were trained by the companies. This is more than a one-third turnover in the occupation.

All five firms answered the question concerning the past growth of the occupation in their firms, but only four answered the remaining questions. For the period 1960 to 1965 three employers reported no change in their needs for optical technicians while two said that the need had increased. Three employers also believed that there would be no change in need for optical technicians over the next five year period, while only one said that the need would increase. All four employers who answered the question agreed that a scarcity of optical technicians existed in the local area.

The same four firms were in distinct disagreement on the value to them that the Jasper County Junior College could be in supplying trained employees. Two of the four said that it would be of no value, while the other two said that such a program would be very valuable to them.

Agricultural Service Occupations Reported

Only ten firms reported occupations in this classification. This was to be expected because most of the agricultural occupations, including farming, were not intended to be included in the survey. Intended for surveying here were agricultural services in which five or more persons were employed and in which an understanding of agriculture is a necessity so that the employee will be able to converse with persons engaged in farming and related occupations. An example of these occupations would be fertilizer salesmen who must know many agricultural facts about soils, crops, farm equipment, etc. before they could successfully deal with farmers or firms that deal in farm products. It is suggested in the recommendations that another survey, concerned with agriculture and agricultural businesses only, be conducted soon in the Jasper County Junior College service area to determine the extent to which agricultural training is needed by farmers and farmer related businesses.

The agricultural service classification is divided into three groups, each of which includes only one occupation. See Table 15.

Group A-1.....Sales and Service Technician

Group A-2.....Landscape and Nursery Technician

Group A-3.....Veterinary Assistant

A total of thirty-two employees were listed by the respondents to this agricultural services classification. Only one of these was a woman. A 6 percent total training rate was revealed and a 15.6 percent replacement rate was reported during 1964 for the three occupations.

Agricultural sales and service technician (Group A-1, Table 15)

The most frequently reported position was that of agricultural sales and service technician where seven firms reported twenty-two employees who sell and service products related to agriculture. All of these were men.

One person was on training in the agricultural sales and service field during 1964 according to the respondents, but four were replaced. One of these companies which reported stated that it had many more agricultural salesmen on its payroll than were reported on the questionnaire, but the companies' desire was to obtain agricultural graduates of a four-year college if such persons were available.

Two comapnies said their need for agricultural salesmen had not changed over the last five years and three said that it had increased. Four firms answered the question on the future growth of agricultural sales and service technicians. Two of these said that the need would remain the same and two said that it would increase.

Five responses were received concerning the local supply of agricultural sales and service technicians. Four of these respondents said that the supply was scarce and one stated that it was adequate.

Three firms believed that a program for training agricultural sales and service technicians could be of some help to them in obtaining new employees if it were offered in the Jasper County Junior College. One stated that it would be very valuable. The fact that 75 percent of the firms indicated that the college could only be of "some help" may reflect the desire by some employers to increase the requirements of this position to four years of college. As mentioned above, a comment of this nature was given by one of the larger employers of agricultural sales and service technicians.

Landscape and nursery technician (Group A-2, Table 15) and Veterinary assistant (Group A-3, Table 15)

These two occupations of landscape and nursery technician and veterinary assistant were reported by only three firms with a total of ten employees in these jobs and only one replacement during 1964. Due to this small number, no attempt will be made to analyze or interpret the results.

Public Service Occupations Reported

The number of occupations reported in the Public Service classification was small as was the number of employer responses. Many of the people who work in municipalities and other public service organizations are reported under one of the other classifications. For example, there were secretaries and accountants listed by these organizations, but these were classified under "Business Occupations."

The representatives of two municipalities responded with the following occupations as presented on Table 15.

Group P-1.....Law enforcement

Group P-2.....Policeman

One respondent reported that both law enforcement officers and firemen needed a post-high school education,

and the other one reported firemen only needed a post-high school education. Because of the relatively small size of the towns in the Jasper County Junior College service area it is unlikely that post-high school education is required for most of the law enforcement officers or firemen. Many of these workers are employed on a part time basis.

A total of thirty-seven employees were listed for these two occupations of law enforcement officers and firemen. In both jobs, all those reported were men. It appears that these municipalities train their employees for these two jobs as the need arises. The total number of trainees and the total replacements were exactly the same within the law enforcement officers occupation and also within the fireman occupation.

One of the respondents indicated that their need for firemen increased over the five year period 1960 to 1965 and also that it would continue to increase over the next five year period 1965 to 1970. The other respondent reported that the number of firemen and law enforcement officers had not changed during the past five year period and probably would not change over the next five years.

Both respondents said that the local supply of trained persons for these occupations was scarce. One of

them said that the Jasper County Junior College could be of no help for training firemen when and if they needed new employees, but the other respondent reported that the college could be of some help in training for both firemen and law enforcement officers.

It would appear that the number of employees would have to be larger than were reported on the questionnaire before serious thought could be given for any type of continuing program for this type of training through the Jasper County Junior College. Further investigation might disclose that a class for upgrading employees would be fruitful if offered at times of need.

Summary of Occupational Groupings

A total of twenty-six groups were reported on Tables 13, 14, and 15 in this chapter. Two of these, "Other Industrial Jobs" and "Other Business Jobs" are eliminated from further discussion because of the wide range of occupations reported, the low numbers in most of the occupations, and other incomplete information.

Table 16 presents the occupational groups ranked from highest to lowest according to three factors: 1)

number of employees; 2) number of replacements; and 3) number of replacements needed in excess of the number of trainees for the group.

Also included in Table 16 are the groups which ranked in the upper one-fourth (1 through 6 rankings) of all three factors and those groups which ranked in the upper one-fourth in two of the three factors.

Those groups which ranked in the upper one-fourth by employee numbers were groups I-4, foreman--first line supervisor; I-6, machine design draftsman, drafting and design technician, metallurgical technician, quality control technician, and industrial X-ray technician; I-7 electrical technician, electronic technician, and instrumentation technician; B-1, accountant, business management, outside salesman (except agriculture), real estate, insurance, finance, retail management and buying, and sales manager; B-2, general secretary, general office, and legal secretary; and, H-3, nurses aide and practical nurse. Those groups which ranked in the upper one-fourth by employee replacements during 1964 were groups I-2, automotive technician; I-5, architectural draftsman, civil and highway technician, and engineering aide; I-6, machine design draftsman, drafting and design technician, metallurgical technician, mechanical

technician, and industrial X-ray technician; B-1, accountant, business management, outside salesman (except agriculture), real estate, insurance, finance, retail management and buying, and sales manager; B-2, general secretary, general office, and legal secretary; and H-3, nurses aide and practical nurse. Those groups which ranked in the upper one-fourth in number of replacements over number of trainees were groups A-2, automotive technician; I-4, foreman--first line supervisor; I-5, architectural draftsman, civil and highway technician, and engineering aide; B-1, accountant, business management, outside salesman (except agriculture), real estate, insurance, finance, retail management and buying, and sales manager; and B-5, food technology, and hotel and motel employees.

Only two occupational groups ranked in the upper one-fourth in all three factors. These were B-1 and B-2. Another five ranked in the upper one-fourth in two factors. These were I-2, I-4, I-5, I-6, and H-3. Therefore, there were seven groups which ranked in the upper one-fourth in either two or three factors.

Using these three factors as a basis for identifying areas in which occupational training may be needed, the highest one-fourth of the groups in at least two of

the three factors have been identified. Tables 17 and 18 contain selected employer facts and opinions concerning these seven occupational groups identified above.

Table 17 shows that in each of the groups identified as being in the upper one-fourth in employee numbers, number of replacements, and excess replacements over trainees, a majority, and for most groups a two-thirds majority, of the respondents indicated no change occurred in need for employees between 1960 and 1965. The overall average showed 69.2 percent of the employers predicted no change. An overall average of slightly less than one-third (27.1%) indicated an increase in employee need for these same high ranking groups. A comparative few (3.7%) indicated a decrease.

The employers' opinions concerning the future need between 1965 and 1970 for employees in each of these high ranking groups was optimistic when compared to growth of the occupations during the preceding five year period. A higher percentage of the total respondents said that the need would increase with a corresponding lower percentage indicating the need would stay the same or decrease.

TABLE 16

THE RANKING OF TWENTY-FOUR OCCUPATIONAL GROUPS ACCORDING TO THE THREE SELECTED QUANTITY FACTORS

Occupational Group*	No. 1 Total Number of Employees		No. 2 Total Number of Replacements		No. 3 Excess Replacements over Trainees		Ranked in Upper One-Fourth in Three Factors	Ranked in Upper One-Fourth in Two Factors
	No.	Rank	No.	Rank	No.	Rank		
I-1	74	12	9	12	- 7	-		
I-2	88	9	22	5	+19	3		I-2
I-3	58	13	5	17	- 6	-		
I-4	254	4	17	7	+11	5		I-4
I-5	104	8	20	6	+14	4		I-5
I-6	259	3	33	3	- 1	-		I-6
I-7	192	5	15	10	- 6	-		
B-1	806	1	121	1	+41	1	B-1	
B-2	347	2	70	2	+41	2	B-2	
B-3	122	7	17	8	0	-		
B-4	76	10	15	11	+ 9	7		
B-5	76	11	17	9	11	6		
B-6	24	17	1	21	- 1	-		
H-1	55	14	6	14	+ 4	8		
H-2	4	23	0	23	- 1	-		
H-3	163	6	26	4	- 3	-		H-3
H-4	22	18	5	16	- 2	-		
H-5	42	15	7	13	+ 1	10		
H-6	11	20	4	18	0	-		
A-1	22	19	4	19	+ 3	9		
A-2	6	22	1	22	0	-		
A-3	4	24	0	24	0	-		
P-1	9	21	3	20	0	-		
P-2	28	16	6	15	0	-		

*See Tables 13, 14, and 15 for occupations in each group.

Upper one-fourth = 1 through 6 rankings.

TABLE 17

EMPLOYERS RATING OF PAST AND FUTURE GROWTH
OF SELECTED OCCUPATIONAL GROUPS

Occupational Group*	Past Growth 1960 to 1965			Future Growth 1965 to 1970		
	Number Reporting					
	Decrease	No Change	Increase	Decrease	No Change	Increase
I-2	1	9	7	1	4	12
I-4	4	16	11	0	17	13
I-5	1	12	10	0	11	12
I-6	1	26	16	0	21	25
B-1	5	161	58	0	131	87
B-2	4	85	20	0	67	35
H-3	1	8	2	0	8	4
TOTALS	17	317	124	1	259	188
Percent	3.7	69.2	27.1	.2	57.8	42.0

*See Tables 13, 14, and 15 for explanation of groups.

TABLE 18

EMPLOYERS OPINIONS ON THE LOCAL SUPPLY OF TRAINED WORKERS AND THE POTENTIAL VALUE OF VOCATIONAL-TECHNICAL PROGRAMS

Occupational Group*	Local Supply of Trained Workers			Occupational Training As Potential Value To Employers		
	Number Reporting			Number Reporting		
	Scarce	Adequate	Over Supply	No Help	Some Help	Very Valuable
I-2	12	5	0	1	7	9
I-4	16	12	1	3	18	11
I-5	18	5	0	0	15	8
I-6	27	17	0	5	18	22
B-1	118	94	1	21	94	101
B-2	40	60	3	4	48	50
H-3	8	4	0	1	5	4
TOTALS	439	197	8	35	205	205
Percent	68.2	30.6	1.2	7.8	46.1	46.1

*See Tables 13, 14, and 15 for explanation of groups.

The majority of the employers responding in six of the seven groups which ranked high in employee numbers, number of replacements, and excess replacement over trainees, as shown on Table 18, believed the supply of trained workers to be scarce. Nearly all of the remaining responses from these six groups indicated an adequate supply. The seventh group, B-2, showed slightly under 40 percent responding that the supply of trained employees was scarce.

A small percentage (7.8%) of the responding employers for each of these high ranking groups of occupations believed that the college could be of no help to them in supplying their needs for new employees. In all of the groups the "some help" responses and the "very valuable" responses were quite evenly distributed.

It appears that the facts and opinions received from employers and presented on Tables 17 and 18 would substantiate and strengthen the top position in which these seven groups were placed.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The Purpose

This study is a survey of business and industry within the Jasper County Junior College business and industry service area to obtain primary information concerning selected occupations common to the area. The importance of the study lies in its value for program development within the college.

Limitations

The study was limited to a survey of occupations in the Jasper County Junior College business and industry service area and which, according to employers, require a post-high school training below the level of a baccalaureate degree. Furthermore, it was limited to employers with five or more total employees except for certain selected smaller businesses.

Review of Related Studies

In recent years many studies have been published which report employee count, employment trends, and type of skills involved in various occupations. However, the extent of these studies varied considerably. Some studies have been conducted to obtain information on a wide range of occupations from unskilled labor to professional, while others obtained information on a narrow range of abilities such as skilled occupations. Still others obtained information within a narrow range of occupational classifications such as engineering technicians, or medical technicians.

Occupational studies have also varied considerably in the geographical area covered. Nationwide, state, and local (city or county) surveys are common. Each of these types has had value depending upon the use which was to be made of this study. Directly or indirectly they all have value as guides for establishing vocational-technical programs in the community colleges of the nation.

Studies which contained quite precise definitions of terms have led to the conclusion that definitions of the same terms vary considerably especially those relating to technicians. Therefore it was difficult to compare some studies. To minimize this difference, and make comparisons

valid, many states have set up a pattern for occupational surveys and used this pattern in several different geographical areas.

A review of the studies supports the proposition that unless training facilities are increased, the present shortages of many jobs at the skilled, technical, and semi-professional levels will continue and in many cases increase.

Occupational studies and surveys at the local level were most significantly related to this study. These sources provided valuable information concerning methodology and occupational listings, as well as related occupational information.

Review of Methodology

The data upon which this study was based was obtained from a questionnaire mailed to selected employers in the Jasper County Junior College business and industry service area. These employers were selected on the basis of having five or more total employees except that certain businesses (physicians, attorneys, accountants, dentists, and optometrists) were included regardless of size, and certain businesses (taverns, bars, barber and beauty shops, and farms) were excluded regardless of size. Specific information

obtained from these employers included the total number of employees, the number of employees in specific occupations, the number of trainees, and the number of replacements for each occupation during 1964. General information concerning the employing firm was also obtained as were employer comments concerning the occupations reported.

The information received on these questionnaires was analyzed first relative to the general information received from the firms. This information included the main activities of the firms, their sources of obtaining skilled, semi-professional, and technical employees, and their willingness to provide representatives to advisory committees for the vocational-technical programs of the college. Next, the specific occupational information was presented according to the broad occupational classifications of Industrial, Business, Health, Agricultural Services, and Public Services. Within each of these occupational classifications, groups or families of similar occupations were also identified on the basis of similarities in training. This last grouping was done under the assumption that the combined needs of these similar occupations could produce a greater justification for curriculum implementation.

From this information the occupational groups were ranked according to number of employees in each group, number of replacements, and number of replacements over trainees. Using this information, supported by employer opinions, conclusions, and recommendations were made relative to vocational-technical curriculums for the Jasper County Junior College.

Review of Findings

The findings obtained in this study show that:

1. Unsolicited applications ranked as the number one method of obtaining skilled, semi-professional and technical employees. A total of 36.2 percent of the employers listed this as the number one method. The same method of obtaining employees was ranked second by another 15.7 percent of the respondents, resulting in 51.9 percent who ranked this method as either first or second in importance.

2. Approximately 35 percent of the respondents indicated a willingness to make available a representative of their firm to serve as a member of a vocational-technical advisory committee for the

college. Those firms which answered affirmatively to this question were in the industrial classifications of Agricultural Services; Manufacturing; Transportation; Communication and Public Utilities; Wholesale and Retail Trade; Finance, Insurance, and Real Estate; and Services. There were no affirmative answers from firms in the industrial classifications of Mining and Contract Construction.

3. A total of 14,430 employees were reported to be employed by the firms responding to the questionnaire. Three thousand and eighty-two, or 21.4 percent, of these positions were listed by employers as having post-high school educational requirements of the type which required a post-high school education below a baccalaureate degree. Of these 3,082 employees, 2,069 were men and 1,013 were women. During 1964 the firms had an additional 316 persons being trained for replacements in these skilled, semi-professional, and technical jobs. They also reported a replacement figure of 445 persons. Thus, according to these figures, the employers had to rely on obtaining the difference, or 129 persons,

from outside the firms during 1964. However, this number could vary since the trainees outnumbered the replacements in several occupations and trainees undoubtedly were not used as replacements in all cases.

4. A total of 1,156 employees were reported in the Industrial occupational classification, nearly all of whom were men. This amounted to 37.5 percent of all the employees reported in skilled, technical, and semi-professional occupations. In addition, the firms had 107 individuals on training for these positions. During 1964, 129, or 11.2 percent of the 1,156 persons were replaced.

   A majority (58) of the responses from employers indicated there had been no change in need for industrial type employees during the period 1960 to 1965. However, a slight majority did indicate that the need would increase over the five year period 1965 to 1970. A two-thirds majority indicated a scarcity of trained persons for these occupations existed in the geographical area.

The largest group or family of occupations by employee numbers within this classification was Group I-6 which included the occupations of machine design draftsman, drafting and design technician, metallurgical technician, mechanical technician, quality control technician, and industrial X-ray technician.

5. Occupations which comprise the occupational classification of Business were held by 1,560 or 50.6 percent of the reported skilled, semi-professional and technical employees. These occupations were nearer equal in numbers of men and women than any of the other classifications. Men totaled 846 and women 714. The replacement rate for the business occupations was considerably greater than the training rate with 149 on some type of training program within the firms but 254 being replaced during 1964.

The number of responses indicating a decrease in need for these business type employees during the 1960 to 1965 period or the 1965 to 1970 period was negligible. Over two-thirds of the employers said

the need had stayed the same during the past five years and nearly two-thirds said it would stay the same over the next five year period. About one-half the responses indicated the supply of trained workers for these occupations to be scarce locally, while the other half stated them to be adequate. The single occupation of legal secretary was the only one in which all of the respondents indicated a scarcity. However, only eight responses were received for the legal secretary occupation. Slightly less than one-half of the responses indicated that the Jasper County Junior College could be of only "some help" to them in preparation of new employees while slightly less than one-half indicated this type of training could be "very valuable." A few responses, 7 percent, said it would be of no value.

Group B-1 in the Business classification was comprised of several occupations for which courses are required in business management, economics, and accounting. These occupations were accountant, business management, outside salesman, real estate, insurance, finance, retail management and buying, and

sales managers. These occupations had the largest number of employees in the business classification with 806. The trainees and replacements were also largest with 80 and 121 respectively.

6. Respondents to the Health occupations reported a total of 297 employees for the eleven occupations in the classification. These eleven occupations were formed into six groups. The number of trainees and replacements were essentially the same during 1964. The rate of training equaled the replacements because of one hospital which trains practical nurses. This hospital believed that the college could be of "some help" in this training.

Considerably more than two-thirds of the responses indicated that there had been no change in need for these types of employees over the 1960 to 1965 period, and approximately the same number expected no change to occur during the next five year period. However, of the slightly less than one-third remaining, nearly all indicated an increase had occurred during the last five years and an increase would also occur during the next five years. There

was a great deal of agreement on the availability of trained persons for the health occupations. Nearly three-fourths of the respondents indicated a scarcity with the remaining indicating "adequate."

Eight percent of the respondents indicated that the college could be of no help to them in their need for new employees with the responses being scattered between groups or occupations. Thirty-three percent said that it could be of "some help" and 59 percent indicated "very valuable."

7. Twenty-four occupational groups were ranked from highest to lowest on: 1) number of employees, 2) number of replacements, and 3) number of replacements needed in excess of trainees available within the firms. The following groups ranked in the upper one-fourth in all three factors:

   Group B-1: Accountants, business management, outside salesmen (except Agriculture), real estate, insurance, finance, retail management and buying, and sales manager.

   Group B-2: General secretary, general office, and legal secretary.

In addition, the following groups ranked in the upper one-fourth in two of the three factors:

Group I-2: Automotive technician.

Group I-4: Foreman--first line supervisor.

Group I-5: Architectural draftsman, civil and highway technicians, and engineering aide.

Group I-6: Machine design draftsman, drafting and design technician, metallurgical technician, mechanical technician, quality control technician, and industrial X-ray technician.

Group H-3: Nurses aide and practical nurse.

A majority of the employer opinions in each of the above groups indicated a local shortage of trained persons except in the B-2 group where a majority of the employers indicated an adequate supply existed of trained workers.

Over 90 percent of the respondents indicated the Jasper County Junior College could be of "some help" or "very valuable" help to them in meeting their need for new employees if appropriate training programs were established in the college curriculum.

8. Seventy-five comments were received on the questionnaires. These comments covered a variety of subjects with many of them relating to course content in various curriculums. It is not the purpose of this study to recommend or analyze particular course content, however the comments of this type can be of value to the college in the development of particular courses.

The highest percentage of comments came from those businesses in the Health occupations classification. Several medical, dental, and optometric employers offered to assist in setting up programs and in making their offices available as training centers for a cooperative type program.

Many respondents, especially from industrial and small businesses emphasized the need for further expansion of the night school program. It would appear from these comments that there is considerable interest in night classes for upgrading personnel. In these comments, as in those related to the health occupations, there were several individuals who offered their services as instructors.

One emphatic comment was received which conveyed a great need for a program in the training of hotel and motel employees. This employer wanted all of his employees to have post-high school training. However, it would appear that his opinion was not held by a majority of the other employers who hire persons for the hotel and motel business. Only a few returns were received from hotel and motel operators and only this one operator indicated special training was necessary.

It was also interesting to note from the comments that the general level of education is rising. Several employers indicated that many occupations presently being filled by high school graduates would, when a replacement becomes necessary, be filled by someone with a post-high school education. Also certain occupations which have in the past required a limited amount of post-high school education, will in the future require much more or even a baccalaureate degree.

Many employers stated directly or implied the need for general education in conjunction with a

vocational-technical specialty. These included suggestions for Speech, English, and those subjects which propose to help persons live in their society. For example, the manager of a nursing home stated: "I find so many of the girls I hire are poor help because they are not taught ethics and public relations." The owner of a sign manufacturing company stated: "I think speech or public speaking and salesmanship should be a requirement for everyone from the 7th grade up. There are very few people who can speak with ease in public. This is something we all must do every day in one form or another."

Conclusions

1. Within the Jasper County Junior College business and industry service area it may be concluded that:

   A. Up through 1960 the total population was relatively stable but the percentage of persons in the age brackets which make up a majority of the labor force decreased, resulting in an increase in the median age of the population.

B. Unemployment in 1960 was only slightly higher than the average in the United States.

C. The number of persons employed in each of the Industrial classifications follows closely the patterns of the State of Missouri and the United States.

2. Societal and technological changes have a bearing on the proper kind and level of vocational-technical education needed to be made available for youth and adults in the Jasper County Junior College service area.

3. The review of related studies reveals that there is a great need for trained individuals in vocational-technical occupations in the United States generally, and specifically in the State of Missouri. It was not the purpose of this study to consider the combined needs of the Jasper County Junior College business and industry service area with those in Missouri or the United States as a whole, but if this were done, further vocational-technical program needs may come to light.

4. It may be concluded that vocational-technical education and the employment opportunities must be matched in the

college service area. Results show over 3,000 skilled, semi-professional, and technical employees exist in the college business and industry service area. Since business and industry provide employment in these occupations, it becomes imperative that the school offer the best in pre-vocational and vocational-technical training.

5. Employers in the Jasper County Junior College business and industry service area expressed a concern over the lack of trained employees. The reaction in the past has been the operation of various training programs by business and industry, but these employers indicate they would like the college to help with part or all of this training.

6. The educational level or amount of training necessary for a particular occupation will vary among employers. For example, more secretaries are known to be in the area than were listed on the returned questionnaires, but some employers believed a high school education sufficient for secretaries, thus secretaries from these firms were not reported. The hotel-motel employees were another example. One employer desired all his

employees to have post-high school training, yet another hotel and motel operator specifically commented that only a high school education was necessary.

7. Employers are willing to cooperate with the college in the implementation and operation of vocational-technical programs. Evidence of this appears through those employers who have offered to serve on advisory committees and through those who have offered to allow their facilities to be used for cooperative type programs.

8. Prospective employees would find it advantageous to seek out their own jobs rather than rely completely on agencies or schools to provide leads, since unsolicited application is the most frequent way skilled, semi-professional and technical employees are obtained by employers in the area.

9. Employers were slightly less willing to predict future trends of employment in various occupations than to tell what happened in the past. Also there was a tendency to be optimistic about the future needs for employees.

10. Training for many of the occupations reported could be provided through short term day or evening programs which would not require a large investment in equipment and could be phased in and out as the need arose.

11. Several studies have been conducted recently in Missouri relating to farm and farm related occupations.[1] These studies indicate there may be a considerable number of agriculturally related occupations existing in the Jasper County Junior College business and industry service area for which programs could be organized.

12. In order to justify training programs for many of the specific occupations, it appears it will be necessary to offer educational preparation in a group or family of related occupations.

13. Those occupational groups in which it appears that the greatest need for programs exists according to employee

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[1]Earl T. Carpenter, Farming Opportunities in Missouri Projected Through 1975 (Columbia: University of Missouri Research Bulletin 746, July 1960); and Warren L. Griffin, Agricultural Occupations Other than Farming in Missouri (Jefferson City: State Department of Education, Agricultural Education Section, 1964).

numbers, training rates, and replacement rates are: I-2, automotive technician; I-4, foreman--first line supervisor; I-6, machine design draftsman, drafting and design technician, metallurgical technician, mechanical technician, quality control technician, and industrial X-ray technician; B-1, accountant, business management, outside salesman (except agriculture), real estate, insurance, finance, retail management and buying, and sales manager; B-2, general secretary, general office, and legal secretary; and H-3, nurses aide and practical nurse.

14. Comments from employers, especially from those whose employees deal directly with the public, may lead to the following conclusion: In nearly all of these occupations a student should have available a curriculum which includes communication skills and sciences, and which will provide a base from which he may be retrained when and if the need arises. However, it was not the purpose of this study to make conclusions or recommendations concerning specific courses.

Recommendations

The recommendations presented here are based on factual and opinion responses of employers in the business and industry service area of the Jasper County Junior College. Therefore, curriculum implementation should only be considered in light of the combination of these recommendations with other factors such as finances, available facilities, staffing, and potential enrollment.

It is recommended that:

1. Advisory committees be used extensively by the Jasper County Junior College for curriculum planning, securing financial support, and providing publicity. Furthermore, these advisory committees should be used to facilitate cooperation in occupational training programs where employer facilities will be used.

2. An extensive survey should be conducted in the Jasper County Junior College business and industry service area involving agriculturally related occupations, including farming and farm related businesses to determine the extent to which the college should become involved in these types of programs.

3. The college make a special effort to publicize the programs of vocational-technical education since it appears that many employers have little knowledge of the possible programs available through a community college.

4. An emphasis be placed on short term programs which may be phased in or out as the need arises.

5. Groups or families of occupations which ranked in the upper one-fourth in at least two of the three factors of numbers of employees, number of replacements, and number of replacements in excess of trainees be given first priority for new curriculums. These groups are:

Group B-1: Accountants, business management, outside salesmen (except agricultural), real estate, insurance, finance, retail management and buying, and sales manager.

Group B-2: General secretary, general office, and legal secretary.

Group I-2: Automotive technician.

Group I-4: Foreman--first line supervisor.

Group I-5: Architectural draftsman, civil and highway technician, and engineering aide.

Group I-6: Machine design draftsman, drafting and design technician, metallurgical technician, mechanical technician, quality control technician, and industrial X-ray technician.

Group H-3: Nurses aide and practical nurse.

6. A close look should be taken at those occupations in which trained persons appear to be in short supply in other areas of Missouri and the United States with the thought of implementing programs which may serve the college service area but could only be justified if training could be done for a larger job market.

Implications for the Use of Business and Industry Surveys as a Technique for the Development of Technical Programs

Under certain conditions the value of this type of survey may be very valuable to the administrative staff of any community college which is contemplating the expansion or implementation of vocational-technical programs.

The following points are recommended by the writer as a result of his experiences in conducting this study of business and industry in the service area of the Jasper County Junior College.

1. The type of survey questionnaire as used in this study must be adapted to the geographical area in which it is to be used.

A. Job titles often mean something different from one part of the country to another. Therefore, the job titles and their definitions must be defined carefully and adapted to the area of use.

B. The terms used within the questionnaire must be well defined so that employers and researcher are conversing in the same terms. For example, the term "vocational-technical" may vary in different areas.

2. The type questionnaire used in this study does not obtain a wide range of information. For example, it ascertains the need for employees according to representatives of business and industry, but does not determine the feasibility of such occupational training in relation to finances, facilities, staff, or course content. Therefore, provisions for obtaining this other information must also be provided.

3. Before a survey of this type is conducted, a very careful check of available information should be made. Many times sufficient information is already

available through local or state agencies. In cases where this information is available much time can be saved in program implementation. Advisory committees may be called in and through these groups plan specific programs using existing information.

However, the conducting of a survey such as has been done in this study can be a very useful tool in the legitimization process to gain support for vocational-technical programs. Much business and industry interest was obtained in the Jasper County Junior College business and industry service area through this study.

4. It should be recognized that this type of survey has the limitation of giving a momentary picture of present employee needs and estimates of future employee needs but cannot take into account uncontrollable economic changes that may affect employment in the future.

BIBLIOGRAPHY

Arnstein, George. "The Technological Content of Vocational Education," Chapter III in The Sixty-fourth Yearbook of the National Society for the Study of Education, Part I Vocational Education. Chicago: University of Chicago Press, 1965.

Board of Education of City of Kansas City. Skilled and Technical Workers in Greater Kansas City: A Survey of Supply and Demand Factors. Kansas City: Board of Education, 1958.

Brandon, George L. Twin City Technicians. East Lansing: Michigan State University, College of Education, 1958.

Brookover, Wilbur B. and Sigmund Nosow. A Sociological Analysis of Vocational Education in the United States. (Specially prepared for the Panel of Consultants on Vocational Education, U. S. Department of Health, Education, and Welfare) Washington: U. S. Government Printing Office, July, 1962.

Burns, Richard L. Factors Governing the Establishment and Operation of Area Vocational-Technical Schools and Programs in the United States with Application to Missouri. Education Series 1964 #93. Columbia: University of Missouri, 1964.

Carpenter, Earl T. Farming Opportunities in Missouri Projected through 1975. Columbia: University of Missouri, 1961.

Educational Policies Commission. Manpower and Education. Washington: National Education Association, 1956.

Emerson, Lynn A. Technical Training in the United States (Prepared for the Panel of Consultants on Vocational

Education, U. S. Department of Health, Education and Welfare). Washington: U. S. Government Printing Office, June, 1962.

Employment Security Commission of North Carolina. North Carolina's Opportunity. A digest of the North Carolina Study of Technical and Skilled Manpower. Raleigh: The Commission, 1962.

Fawcett, Claude W. "Technological Change and Education," Journal Secondary Education, XXXVI, pp. 16-19. Burlingame: California Association of Secondary School Administrators, January, 1961.

Florida, State Department of Education. A Handbook for Conducting Vocational Surveys. Bulletin #70H-7. Tallahassee: State Department of Education, March, 1964.

Galton, Lawrence. "Will Space Research Pay Off on Earth," New York Times Magazine, May 26, 1963, p. 29.

Griffin, Warren L. Agricultural Occupations Other Than Farming in Missouri. Jefferson City: State Department of Education, Agricultural Education Section, 1964.

Hall, George. Higher Education in Three Selected Areas of Missouri. Jefferson City: Missouri Commission on Higher Education, 1964.

Harris, Norman C. "Community College Technical Education," North Central Association Quarterly, XXXVI, No. 4. Menasha: North Central Association of Colleges and Secondary Schools, 1962.

_____. Technical Education in the Junior Colleges/ New Programs for New Jobs. Washington: The American Association of Junior Colleges, 1964.

Joplin Chamber of Commerce. Community Development Survey. Joplin: Joplin Chamber of Commerce, August, 1962.

Kavieff, Melvin C. Requirements for Selected Occupations in the Automotive Manufacturing Industry with Implications for Technical Education. Detroit: Board of Education, 1962.

Michigan Employment Security Commission, Calhoun County Plans for the Future. Detroit: The Commission, 1960.

_____. Detroit Metropolitan Area Survey of Training Needs, Mayor Committee Report, 1963. Detroit: The Commission, 1963.

Mid-Missouri Development Council and the University of Missouri. Final Report of an Industrial Survey. Columbia: College of Engineering, Engineering Experiment Station, March, 1961.

Missouri, State of. Missouri County Data. Jefferson City: Division of Commerce and Industrial Development, State of Missouri, 1964.

Missouri, State Board of Education. Manual of Operation for Vocational Education Programs in Missouri. Jefferson City: State Department of Education, January, 1965.

Murphy, Cristy A. and others. Technicians Need Study: Vermillion County Illinois. Urbana: University of Illinois, May, 1964.

National Science Foundation. The Long-Range Demand for Scientific and Technological Personnel: A Methodological Study. Washington: U. S. Government Printing Office, 1961.

Nosow, Sigmund and William H. Form (eds.) Man, Work and Society, A Reader in the Sociology of Occupations. New York: Basic Books, Inc., 1962.

Ohio Bureau of Unemployment Compensation. Youngstown-Warren Area Skills Survey, 1960-1965. Youngstown: Ohio Bureau of Unemployment Compensation, 1961.

Pasadena City Schools. Survey of Vocational-Technical Needs for the Pasadena-San Gabriel Valley Area. Pasadena: Pasadena City Schools, 1961.

Pomfret, John D. "Technological Change Has Played a Major Role in Recent Strikes," New York Times, July 14, 1963, p. E3.

Prater, Robert L. Employment Opportunities and Training Needs for Technicians in the State of Missouri with Projections Through 1970. Doctoral dissertation. Columbia: University of Missouri, 1962.

Smith, Leo F. and Laurence Lipsett. The Technical Institute. New York: McGraw-Hill, 1956.

Stockton, Frank T. Scientists and Engineers in Greater Kansas City: A Survey of Demand and Supply Factors. Kansas City: Missouri Division of Employment Security, 1957.

U. S. Bureau of Census. County Business Patterns, First Quarter 1962, Part 5A, West North Central (Iowa, Minnesota, Missouri). Washington: U. S. Government Printing Office, 1962.

_____. U. S. Census of Population: 1960. General Social and Economic Characteristics, Missouri Final Report PC(1)-27c. Washington: U. S. Government Printing Office, 1962.

U. S. Department of Health, Education and Welfare. Education for a Changing World of Work--Report of the Panel of Consultants on Vocational Education. Washington: U. S. Government Printing Office, 1964.

U. S. Department of Labor, Bureau of Employment Security. Dictionary of Occupational Titles. Washington: U. S. Government Printing Office, 1949.

_____, Bureau of Labor Statistics. Employment of Scientific and Technical Personnel in Industry 1962, Bulletin No. 1418. Washington: Superintendent of Public Documents, June, 1964.

_____, Bureau of Labor Statistics. Employment of Scientific and Technical Personnel in State Government Agencies. Superintendent of Documents, Bulletin No. 1412. Washington: U. S. Government Printing Office, June, 1964.

_____, Bureau of Statistics. Labor Force, Employment, and Unemployment Statistics, 1947-61. Washington: U. S. Government Printing Office, 1962.

Wisconsin, State of. The Inter-Agency Study of Manpower Requirements, Training Resources, and Educational Needs for Marathon County. Wausau: Wisconsin State Employment Service, 1960.

_____. Counselors Guide to Occupational and Other Manpower Information, An Annotated Bibliography of Selected Government Publications, Bulletin No. 1421. Washington: U. S. Government Printing Office, November, 1964.

_____. Employment of Scientific and Technical Personnel in State Government Agencies; A Report on a 1959 Survey. Washington: U. S. Government Printing Office, 1961.

APPENDICES

APPENDIX A.--LETTER TO EMPLOYERS

JASPER COUNTY JUNIOR COLLEGE
310 West 8th Street
Joplin, Missouri

February 26, 1965

Dear Sirs:

The Jasper County Junior College desires your help in a vocational-technical survey which includes the service area of the college.

Our purpose is to determine the type of jobs that exist in the area, so that we may consider expanding our offering of courses to benefit area business and industry, either through upgrading present employees or by training new employees.

We have tried to design the enclosed questionnaire so that it will neither require much investigation in finding answers nor require a great deal of your time. (The average time required to complete the questionnaire should be about 15 minutes.)

Please read the directions carefully. Note that we are interested in jobs that would require some type of training beyond high school today, regardless of the level of education that was required for the individual presently holding the job.

We are asking that you return the questionnaire by March 10, 1965. In the event that you have no employees who would need training above the high school level, please complete page one only and return it in the enclosed envelope.

Your cooperation is greatly appreciated. Only summarized information will be published.

Sincerely,

JASPER COUNTY JUNIOR COLLEGE
Harlan L. Heglar
Harlan L. Heglar
Administrative Intern
James K. Maupin
James K. Maupin
Director, Evening Division

HLH:cas
Enclosures

APPENDIX B.--BUSINESS AND INDUSTRY

JASPER COUNTY JUNIOR COLLEGE
JOPLIN, MISSOURI

VOCATIONAL-TECHNICAL EDUCATION SURVEY

CONFIDENTIAL FORM

Part I General Information

1. Name of Firm_____ 2. Mailing Address_____

3. Name of person reporting_____ 4. Total number of persons on payroll of the company_____

5. Position of person reporting (check one): (1) Owner___ (2) Owner-Mgr.___ (3) Mgr.___ (4) Personnel Mgr.___ (5) Educ. Dir.___ (6) Other (specify)_____

6. Please mark in 1, 2, 3 order the space opposite the description which best identifies the activities of your firm.

___ (1) Advertising
___ (2) Agricultural services
___ (3) Communication - radio, telephone, TV
___ (4) Financial institution
___ (5) Government - Federal, state, local
___ (6) Health - medical, dental, hospital, optometry
___ (7) Insurance
___ (8) Legal service
___ (9) Mining
___(10) Manufacturing - food products
___(11) Manufacturing - wearing apparel
___(12) Manufacturing - lumber and wood products
___(13) Manufacturing - printing and publishing
___(14) Manufacturing - chemical and allied products
___(15) Manufacturing - stone, clay, and glass products
___(16) Manufacturing - primary metal products
___(17) Manufacturing - fabricated metal products
___(18) Manufacturing - machinery
___(19) Manufacturing - transportation equipment
___(20) Real Estate
___(21) Repair services - automotive
___(22) Repair services - TV, electrical, etc.
___(23) Retail - eating places
___(24) Retail - drug stores
___(25) Services - hotel and motel
___(26) Services - laundry, dry cleaning
___(27) Transportation - passenger, truck, etc.
___(28) Utilities - electric, gas, etc.
___(29) Wholesale or retail - automotive sales and parts
___(30) Wholesale - drugs, chemicals
___(31) Wholesale or retail - food
___(32) Wholesale or retail - hardware, plumbing, heating, electrical goods
___(33) Wholesale or retail - machinery and supplies
___(34) Wholesale or retail - general merchandise (department stores)
___(35) Wholesale or retail - apparel and accessories
___(36) Wholesale or retail - home furnishings
___(37) Other (specify)_____
___(38) Other (specify)_____
___(39) Other (specify)_____

7. From what sources do you now obtain most of your skilled, semi-professional, or technical, (not un-skilled) employees? Please mark 1, 2, and 3 for your top three sources in order of their importance.

___ (1) Unsolicited applications
___ (2) State Employment Office
___ (3) Upgrading employees
___ (4) Advertising
___(5) Private employment agencies
___(6) Union
___ (7) Schools
___ (8) Other (specify)_____

8. Would a representative of your firm be willing to serve on an advisory committee in the development of vocational-technical programs of study in the Jasper County Junior College? ___ Yes ___ No ___ Undecided

PLEASE READ DIRECTIONS CAREFULLY

Part II Jobs for People With Formal Education Beyond High School, But Less Than Four-Year College Degree

Please supply the information requested, relative to your establishment or firm, for the kind of semi-professional and technical jobs listed below for which one or two years of post-high school education are ordinarily considered desirable or essential for replacement in that position. Be sure to consider all the sections--A, B, C, D, E.

Type of Job	Average no. on payroll in 1964 (except trainees)		Average no. of trainees in 1964	Total no. replacements required in 1964	Past Growth annual rate of employment 1960-1965 (check one)			Future Growth Expected annual rate of employment 1965-1970 will (check one)			Local supply of trained employees is (check one)			If training for this position were given in Jasper County Junior College, would it help in fulfilling your needs for new employees? (check one)		
	Men	Women			Decreased	Stayed Same	Increased	Decrease	Stay Same	Increase	Scarce	Adequate	In Surplus	No help	Some help	Very Valuable
A. Industrial jobs:																
1. Air cond., refrig., and/or heating technician																
2. Draftsman, architectural																
3. Draftsman, mach. design, etc.																
4. Automotive technician																
5. Chemical technician																
6. Civil and highway technician-surveyor																
7. Drafting and design tech.																
8. Electrical technician																
9. Electronic technician																
10. Engineering aide																
11. Hydraulics technician																
12. Foreman-first line supervisor																
13. Industrial technician																
14. Metallurgical technician																
15. Instrumentation technician																
16. Mechanical technician																
17. Quality control technician																
Other (write below) 18.																
19.																
B. Agricultural jobs, etc.:																
1. Sales and service technician																
2. Landscape and nursery tech.																
Other (write below) 3.																
4.																

Appendix B.--continued.

Type of Job	Average no. on payroll in 1964 (except trainees)		Average no. of trainees in 1964	Total no. replacements required in 1964	Past Growth annual rate of employment 1960-1965 (check one)			Future Growth Expected annual rate of employment 1965-1970 will (check one)			Local Supply of trained employees is (check one)			If training for this position were given in Jasper County Junior College, would it help in fulfilling your needs for new employees? (check one)		
	Men	Women			Decreased	Stayed Same	Increased	Decrease	Stay Same	Increase	Scarce	Adequate	in Surplus	No help	Some help	Very Valuable
C. Business jobs:																
1. Accountant																
2. Advertising and/or commercial art																
3. Business data processing																
4. Business machine operator																
5. Business management																
6. Food technology																
7. Merchandising and display																
8. Outside salesman (except agriculture)																
9. Printing																
10. Real estate, insurance and/or finance																
11. Retail management and buying																
12. Sales manager																
13. Secretary (general)																
14. Secretary (legal)																
Other (write below)																
15.																
16.																
17.																
D. Public Service jobs:																
1. Law enforcement																
Other (write below)																
2.																
3.																
4.																

Appendix B.--continued.

Type of Job	Average no. on payroll in 1964 (except trainees)		Average no. of trainees in 1964	Total no. replacements required in 1964	Past Growth annual rate of employment 1960-1965 (check one)			Future Growth Expected annual rate of employment 1965-1970 will (check one)			Local supply of trained employees is (check one)			If training for this position were given in Jasper County Junior College, would it help in fulfilling your needs for new employees? (check one)		
	Men	Women			Decreased	Stayed Same	Increased	Decrease	Stay Same	Increase	Scarce	Adequate	In Surplus	No help	Some help	Very Valuable
E. Health, Hospital, and Medical jobs:																
1. Dental office assistant																
2. Dental hygenist																
3. Medical office assistant																
4. Medical lab. technician																
5. Nurse (practical)																
6. Optical technician																
7. X-ray technician																
8. Secretary (Medical)																
9. Secretary (Dental)																
10. Optometric Office Assistant																
Other (write below)																
11.																
12.																

Part III General Comments

General Comments (Add any comments which you or other officials in your firm may wish to make about the improvement of education and training opportunities at the post-high school level through the Jasper County Junior College Vocational-Technical programs. Include your suggestions for the kind and level of educational programs which should be provided). Put additional comments on the back of this page.

Please return this questionnaire in the enclosed envelope.

Thank you for your interest and cooperation.

JASPER COUNTY JUNIOR COLLEGE

APPENDIX C.--FOLLOW-UP LETTER TO EMPLOYERS #1

JASPER COUNTY JUNIOR COLLEGE
310 West 8th Street
Joplin, Missouri

March 12, 1965

Dear Sir:

Recently we mailed you a vocational-technical questionnaire concerning the types of jobs that exist in your business or industry.

As yet, we have not received the completed questionnaire from you. Your answers are important in establishing the need for post-high school vocational-technical programs in the area.

We hope that you will assist in the survey by completing the questionnaire promptly and returning it to us.

Thank you.

Sincerely,

JASPER COUNTY JUNIOR COLLEGE

Harlan L. Heglar

Harlan L. Heglar
Administrative Intern

James K. Maupin

James K. Maupin
Director, Evening Division

HLH:cas

APPENDIX D.--FOLLOW-UP LETTER TO EMPLOYERS #2

JASPER COUNTY JUNIOR COLLEGE
310 West 8th Street
Joplin, Missouri

March 22, 1965

Dear Sirs:

The response to the Jasper County Junior College Vocational-Technical Survey has been most rewarding.

However, there are still some questionnaires that have not been returned, and according to our records yours is one of these.

We are therefore taking the liberty of sending you another copy of the questionnaire and cover letter in case you have misplaced the first one. We hope that you will use a few minutes of your time to complete and return the questionnaire in the enclosed return envelope.

Please read the directions carefully on both the cover letter and the questionnaire. If we can be of any help to you please feel free to call us at the college.

Thank you again for your cooperation

Sincerely,

JASPER COUNTY JUNIOR COLLEGE

Harlan L. Heglar

Harlan L. Heglar
Administrative Intern

James K. Maupin

James K. Maupin
Director, Evening Division

HLH:cas

Enclosures

APPENDIX E.--DEFINITIONS OF OCCUPATIONS

Industrial Occupations

Group I-1

Air conditioning, refrigeration, and/or heating technician. Installs, maintains, and repairs equipment used in refrigeration, heating, and air conditioning systems in buildings and vehicles. May lay out a system for an office, store, or other location and/or read blueprints for layout.

Group I-2

Automotive technician. Perform repair and maintenance tasks such as overhauling engines of autos, trucks, etc. with skill in use of technical equipment.

Group I-3

Chemical technician. Performs routine analytical work under supervision of a professional chemist. Furnishes test data, cleans lab equipment, maintains supply of chemicals.

Group I-4

Foreman--first line supervisor. Supervises assembly line workers usually engaged in several occupations. Must possess a detailed knowledge of process involved

Appendix E--continued.

volved but not necessarily skilled in the jobs supervised.

Group I-5

Draftsman, Architectural. Sketches and details architectural and structural features of any class of buildings and like structures. Uses drawing instruments. Assists an architectural engineer. May make calculations concerning the strength, reliability, and cost of materials.

Civil and highway technician--surveyor. Does level and transit work in surveying, makes and checks surveying and construction notes, tests soils and other materials, performs routine engineering design computations, makes construction drawings, or supervises and inspects construction work.

Engineering aide technician. Usually assists a professional engineer by performing specialized tasks under his general supervision.

Group I-6

Machine design draftsman. Specializes in drawing of parts and assemblies of various types of machines

Appendix E--continued.

and tools, using drawing instruments. Assists a mechanical engineer. May make calculations concerning the strength, reliability, and cost of materials.

Drafting and design technician. Prepares clear and working drawings under the direction of a draftsman for general engineering or manufacturing purposes.

Metallurgical technician. Assists metallurgist in examining and testing metal samples to determine their physical properties. Conducts routine examinations of metals and alloys.

Mechanical technician. Assists mechanical engineer in the mechanical industrial process, or planning and operation of mechanical systems. May function as operators of power plants or heavy machinery, inspectors, maintenance or set-up men. Often work with engineers in eliminating production problems.

Quality control technician. Checks and reports on quality of product produced through inspection and testing with quality as an objective.

Appendix E--continued.

Industrial X-ray technician. Performs many of the same duties as a metallurgical technician but specializes in the X-ray of metals.

Group I-7

Electrical technician. Lays out, installs, tests, and maintains electrical equipment and wiring. Generally of a more specialized nature than simple wiring.

Electronic technician. Tests, repairs, adjusts, assembles, etc., electronic and electrical equipment, prepares and interprets engineering drawings and sketches, and renders assistance to the electronic engineer.

Instrumentation technician. Assists in fabricating, adjusting, testing, and repairing finely calibrated instruments. May specialize in electronics, mechanics, or hydraulics. Works with engineers and scientists who use these instruments.

Appendix E--continued.

Business Occupations

Group B-1

Accountant. Skilled in the knowledge, science, and practice of accounting. Analyzes business records and prepares financial reports.

Business Management. Persons operating small businesses, or where business training is important to their position.

Outside salesmen (except Agricultural). Solicits and sells various types of products. Contacts customers at their homes or place of business. Sets up and demonstrates products.

Real estate, insurance, finance. Persons engaged in the specialized business of selling real estate, insurance, or working in banks, loan companies, etc., requiring a special training.

Retail management and buying. Managing retail departments or responsible for buying products for departments.

Appendix E--continued.

Sales Manager. Supervises salesmen, conducts sales meetings, and is responsible for the operation of sales.

Group B-2

General secretary. Assists an executive in the performance of minor duties. Makes appointments, interviews callers, writes routine correspondence. Higher level secretaries may help in preparation of manuscripts or general office supervision.

General office. All around office procedure with no specialization but proficient in typing correspondence and office procedures of invoicing, telephoning, and record keeping.

Legal secretary. A secretary specializing in correspondence, records, and procedures common to legal offices.

Group B-3

Business data processing. Conducts business applications of data processing equipment and systems. Programs and operates data processing equipment.

Appendix E--continued.

Business machine operator. Operates common business machines for record keeping or posting accounts, inventory control, etc.

Group B-4

Advertising and/or commercial art. Does work of illustration, design, advertising layout, spot illustration, lettering, and art production.

Merchandising and display. Generally merchandises products within a store and/or sets up displays in connection with the job. Knows the products well.

Group B-5

Food technology. Persons engaged in managing food establishments, food production supervisor, chefs, etc.

Hotel-motel employees. Persons in the service aspect of hotels, motels, and other similar operations.

Group B-6

Printing. Performs duties in connection with operating or printing machinery requiring a high level of skill (not mimeographing). A very broad category.

Appendix E--continued.

Health Occupations

Group H-1

Dental office assistant. Performs functions of chairside assistant and laboratory aide. May also perform duties including record keeping, making appointments and collecting accounts.

Medical office assistant. Prepares patients for examination, treatment, and/or minor surgery, assists physician in performing his work.

Optometric office assistant. Performs functions of chairside assistant and laboratory aide. May also perform duties including records, making appointments, and collecting accounts.

Group H-2

Dental hygienist. Cleans teeth, charts decays and disease for diagnosis by dentist, and performs other dental duties not reserved by law to dentists. May take and develop X-rays, mix compounds, prepare solutions and act as chairside assistant.

Appendix E--continued.

Group H-3

Practical nurse. Licensed as a practical nurse. Works under the supervision of a trained nurse or doctor. Usually performs duties as observing and recording symptoms and reactions of selected patients; giving prescribed treatments and medications; taking patients' temperatures, pulse, and blood pressure; and helping with personal hygiene tasks. In all their work they must refrain carefully from performing nursing services that are beyond the scope of their training and skill.

Nurses aide. Performs some of the same duties of a practical nurse such as personal hygiene tasks. Does not generally administer medicines, nor have as much responsibility as a practical nurse.

Group H-4

Medical lab technician. Performs duties in a hospital or medical laboratory making laboratory analysis of urine, blood, infections, etc. Also prepares vaccines or slides.

Appendix E--continued.

Medical X-ray technician. Performs X-ray functions in medical offices, clinics, and hospitals, including preparing and placing patients in position for X-ray, keeps equipment in good working order, develops X-rays, and operates X-ray.

Group H-5

Medical secretary. Specializes in medical office duties including scheduling appointments, keeping medical records, purchasing supplies, collecting accounts, and maintaining the general appearance of the office.

Dental secretary. Specializes in dental office duties including scheduling appointments, keeping dental records, purchasing supplies, collecting accounts, and maintaining the general appearance of the office.

Group H-6

Optical technician. Performs duties of grinding lenses to prescription and assembling lenses into frames.

Appendix E--continued.

Agricultural Service Occupations

Group A-1

Sales and service technician. Sells, sets up, demonstrates, and adjusts agricultural machinery and equipment; sells and recommends use of products for production of farm crops and animals.

Group A-2

Landscape and nursery technician. Cultivates trees, shrubs, and flowers in nursery or lays sod and transplants trees, etc., for customers. Familiar with the application of fertilizers, sprays, etc.

Group A-3

Veterinary assistant. Assists the veterinary in handling and caring for animals. May make calls with the veterinary but generally works in the veterinary clinic.

Public Service Occupations

Group P-1

Law enforcement. Mainly police officers who help

Appendix E--continued.

preserve law and order in cities and towns. May be on patrol or traffic duty.

Group P-2

Fireman. Protect life and property from fire, principally as a full time fireman. Performs duties of fighting fires, carrying people to safety, or administering first aid. Also may help in fire prevention.