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A STUDY OF THE CHARACTERISTICS OF STUDENTS, TEACHERS, AND THE CURRICULUM OF INDUSTRIAL-TECHNICAL EDUCATION IN THE PUBLIC COMMUNITY JUNIOR COLLEGES OF MICHIGAN

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ABSTRACT

A STUDY OF THE CHARACTERISTICS OF STUDENTS, TEACHERS, AND THE CURRICULUM OF INDUSTRIAL-TECHNICAL EDUCATION IN THE PUBLIC COMMUNITY JUNIOR COLLEGES OF MICHIGAN

By Milton E. Larson

The purpose of this dissertation was to study the characteristics of the students, teachers, and the curriculum of industrial-technical education in the public community junior colleges of Michigan. To achieve the purpose required research in three areas.

The data relative to teachers was secured from the files of the office of the Superintendent of Public Instruction. Information about the curricula was obtained from the catalogs and brochures of the colleges. A follow-up study was made of all students who initially enrolled in industrial-technical curricula during the school year 1958-59. This study included both drop-outs and graduates. Seventy-two per cent or 297 of the 412 in the total population responded.

<u>Summary of the Characteristics of the Teachers</u>

During the school year 1960-61, 138 teachers were employed by the public community junior colleges on programs of industrial-technical education involving monies allocated in accordance with the provisions of the National Defense Education Act, Title VIII. Seventy-five of these instructors were employed by 5 of the 11 colleges.

One-half of these instructors had earned at least the master's degree. Industrial arts was heavily represented among the bachelor's

degrees. Forty-one of the 59 teachers who had master's degrees received them in industrial education, industrial arts, or vocational education. Sixty-five per cent of the instructors listed 12 semester hours or less in courses of teaching methods. The median number of semester hours in technical subject matter courses reported by the instructors was 18. One instructor in 4 had taken more than 48 semester hours in technical courses. Two of every 3 instructors earned the bachelor's and master's degrees in Michigan.

Twenty-one of the 138 instructors had completed an apprenticeship. The median of closely related work experience was 50 months. But, the median number of years of teaching experience was 8.

Thirty-eight per cent of the instructors had community college certificates as well as vocational certificates.

Summary of the Characteristics of the Curricula

Industrial-technical curricula were listed by each of 13 different public community junior colleges in Michigan. A composite list of 38 different programs was classified under the 13 main curricular headings.

The most common curriculum was drafting technology while the least frequently listed curricula were architecture, body drafting and industrial management technology.

The most common admission requirement was graduation from high school. While most colleges required successful completion of 62 semester hours with an honor point ratio of 2 for graduation, one college required 83 semester hours with an honor point ratio of 2.

Summary of the Characteristics of All Student Respondents

All 297 respondents were male with 74 per cent under the age of 21. Only 12 per cent were married at the time of initial enrollment. Fifty-four per cent were residents of the local district.

Sixty-five per cent of the enrollees said they earned a C average in high school. Ten per cent had previously attended another college or university.

Sixty per cent came from homes in which the father worked as either an unskilled, semiskilled, or skilled worker.

Work, financial assistance from parents, and personal savings were the most important methods of financing the education of these people.

Thirty-four per cent of the students indicated less than 3 semesters of full-time college work. Over one-half of all the respondents had taken some work in college on a part-time basis. Thirty-eight per cent completed 61 or more semester hours while 85 per cent reported continuous enrollment on a sequential program.

Fifty-two per cent of the students worked on part-time jobs and 22 per cent on full-time jobs while attending college.

Thirty-nine per cent said they would select the same occupation now as they had previously indicated.

With the exception of the placement function, the students were well satisfied with the manner in which the counseling and guidance functions were performed.

Four of every 10 students indicated securing the first job

through their own efforts and only 8 per cent through the college placement service.

The most helpful subjects in college, named by the respondents were those in drafting and design, mathematics, electricity and electronics, English, and the technology subjects. English drew the largest number of respondent's votes as the subject that needed to be geared more to the needs of technicians; with mathematics, second.

Eighty-three per cent were of the opinion that the community junior college offered a good environment in which to study and learn.

Nineteen per cent of the students believed the courses were too general and 27 per cent thought that a two-year program was too short.

Thirty-one per cent said that too much emphasis was placed on theory and not enough on practical applications, and 44 per cent believed that the time devoted to developing hand and machine skills should be increased.

Considering as a group the respondents who had not graduated, 8 per cent were still attending the community junior college; 7 per cent had transferred to another college; 5 per cent had accepted an apprenticeship; 7 per cent had entered the military services, and 19 per cent accepted employment.

Eighty-four per cent were presently employed on either a full or a part-time job. Twenty-four per cent were employed on a job they considered a technician's job, while 15 per cent were working on skilled jobs. Most of the respondents, that is, nearly three-fourths of them were employed in Michigan with 49 per cent working in the same community in which the college attended is located. The median salary on the first job after college was $87 per week and on the present job, $101 per week.

Even though 58 per cent believed they could have obtained their present job without their community junior college education, 39 per cent believed their college education was helpful in securing the first position, and 40 per cent said that their present job was closely related to the education acquired at college. One student in 4 said he needed additional training to fulfill the job requirements of the first position.

Approximately one-half of the students were well satisfied with their job even though only 35 per cent were working at the kind of job prepared for while attending college.

Summary of the Characteristics of the Students Who Graduated

One hundred one students, 34 per cent of the group graduated from the industrial-technical curricula of the Michigan public community junior colleges.

More than three-fourths of the graduates started college between the ages of 17-20 inclusively. Fourteen per cent had previously attended another college or university. Most of these students were enrolled continuously on a sequential program. Nearly one-half attended classes on a part-time basis at some time during college. Sixty-two per cent completed the curricula in two years. Approximately 60 per cent of the graduates earned grade averages in college of C while about 40 per

cent had grade averages of B.

Seventeen per cent worked on full-time jobs and 66 per cent on part-time jobs while attending college.

A desire for additional courses in mathematics and leadership was the expression of the largest number of students who wished to take additional courses. Drafting and design, and technology were considered by most as the courses most helpful while physical education and social science were considered least helpful. English and mathematics were considered to be the courses most in need of revision in order to meet the needs of technicians. Most felt that courses were not too specific but 20 per cent thought the courses were too general. Twenty-two per cent said that too much emphasis was placed on theory. About one-half of the graduates felt the time devoted to development of hand and machine skills should be increased. Sixty-eight per cent expressed a desire to take more courses.

After graduation 77 per cent found full-time employment and 6 per cent part-time work. Forty per cent were employed on jobs they considered technician's jobs. Seventy-two per cent found employment in the home community or within 50 miles of the college attended.

Four out of every 10 believed they could have obtained their present position without attending the community junior college. Only 53 per cent said their present position was closely related to the education received. Sixty per cent agreed that the education received at college helped them secure their first position. Forty-five per cent were well satisfied with their present position. About one-half said they were working at the kind of position prepared for at college.

Forty-five per cent believed the education would help them achieve "middle-management" positions.

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CHAPTER I

INTRODUCTION TO THE PROBLEM, DEFINITION OF TERMS, AND INVESTIGATIONAL PROCEDURES EMPLOYED

Recognition of the need for additional education for the large segment of youth who do not enter four-year colleges led to the development of so-called terminal curricula in the community junior colleges. Many of these colleges offered curricula of the industrial-technical type employing faculty members and providing facilities to educate enrolled post-high school youth to take their place in industry and in related activities. The graduates of these occupational curricula often become members of the technological team. This team usually is composed of scientists, engineers, technicians, and craftsmen.

I. THE PROBLEM

Statement of the problem

The purpose of this problem was to identify some of the basic characteristics of (1) students in industrial-technical education in Michigan public community junior colleges (2) the faculty engaged in industrial-technical education in Michigan public community junior colleges and (3) the curricula in institutions offering programs in industrial-technical education in Michigan public community junior colleges.

Importance of the study

The community junior college has frequently been described as the fastest growing educational institution in the State of Michigan as well as in the United States. As has been stated by B. Lamar Johnson writing for the Fifty-fifth Yearbook of the National Society for the Study of Education, "The junior college represents more than a promise for the future. It is a vital present-day reality, a vigorous institution."[1]

As the community junior college has become more firmly established its five-fold purpose has become more clearly understood and more universally accepted. Tyrus Hillway described the purposes of the two-year college as follows:

> The philosophy of the modern two-year college, while there are wide variations among the specific programs, mainly centers around (1) the democratization of higher education through extension of greater opportunity to all youth; (2) community service; (3) vocational training for the semiprofessions; (4) more effective adult education; and (5) guidance and rehabilitation.[2]

James Bryant Conant recognized the importance and the potential of the community college when he wrote:

> Those institutions which are now coming to be called "community colleges" offer the best hope of meeting the postwar surge for vast expansion of education beyond the high school. They likewise can serve most effectively as centers for adult education. Their

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[1]Nelson B. Henry, The Public Junior College -- The Fifty-fifth Yearbook of the National Society for the Study of Education (Chicago: The University of Chicago Press, 1956), p.5.

[2]Tyrus Hillway, The American Two-Year College (New York: Harper Brothers, Publishers, 1958), pp. 82-83.

> curricula should combine general education and vocational training, and they should be defined as terminal two-year colleges.[3]

Industrial-technical education is one of the important functions of the community junior college. Some authors describe it as the "vocational training for the semi-professions". Improvement of industrial-technical education necessitates greater information about the programs, instructors, and students functioning on the local level. Students educated as technicians often become members of the technological team. The importance of the technological team was stressed by Henry Armsby when he said:

> ...This small body of men and women who have made our industrial team, our engineers, scientists, and technicians, constitute our best hope of success in either hot or cold war -- our prime source of progress in peace. This team has been the major cause of the real standard of living in America doubling every 40 years and the reduction of the average work week from 65 hours in 1880 to 40 hours in 1953. This team has given America the equivalent of 60 mechanical slaves for each citizen, the largest number available in any nation on the globe. If we multiply our actual population by 60 we have what we might call a technical population of 7½ billion people. This is why we are able to produce more than the rest of the world.[4]

Education is the fundamental source of strength for potential members of the technological team. The importance of dynamic education, vital education and balance in education has been stressed by such leaders as Roy E. Larsen, President of Time Incorporated,[5] Doctor

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[3]James Bryant Conant, Education in a Divided World (Cambridge: Harvard University Press, 1948), pp. 200-201.

[4]Henry H. Armsby, "Technological Team; Most Valuable National Resource," School Life, 37:58-9, January, 1955.

[5]Raymond F. Howes, Higher Education and the Society It Serves (Washington: American Council on Education, 1957), p. 12.

Ernest O. Melby and Doctor Morton Puner in the book Freedom and Public Education,[6] and Dr. Caswell, President of Columbia Teacher's College.[7]

Improvement in education must be built upon an understanding of the present state of educational development, present accomplishment, and realistic appraisal of the needs of the future. This places educational research of an applied nature in a very strategic position.

What is the status of industrial-technical education in Michigan? Is it really geared to the present and future needs of the people? Is our educational program a well balanced program for those who attend the public Michigan community junior colleges in the industrial-technical departments? Are these institutions providing the vital education essential for immediate occupational employment for those students who can only devote two years in addition to the years of high school to the vital preparation for positions as technicians?

Doctor Hollis L. Caswell made the point very clear when he stated that, "...The most dangerous educational mistake that could be made in a democracy would be to assume that only the gifted are worth education to their full potential."[8]

Most of the advances in technology are the result of people who have a strong dedication and understanding of the philosophy, processes,

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[6]Ernest O. Melby and Morton Puner, Freedom and Public Education (New York: Frederick A. Praeger, Inc., 1953) pp. 1-15.

[7]Grant S. McClellan, America's Educational Needs (New York: H. W. Wilson Company, 1958) pp. 69-70.

[8]Ibid. p . 47.

and techniques of technology. The great impact of technology upon the growth, development, and position of the United States as a world power is clearly indicated in the following quotation from the book, A Policy for Scientific and Professional Manpower:

> The United States has only about 6 per cent of the world's population. America's position as a world power, its ability to produce almost half of the world's output of goods, and its standard of living depend far more upon the advanced technology and the quality of its manpower than on the size of its working force.[9]

This study is important because it provides an opportunity for those individuals in positions of leadership in education in Michigan to learn more about the adequacy of opportunities provided in the occupational curricula of the community junior colleges. This study provides information as to what the students are like, what they think of their experiences in industrial-technical programs and how successful they are in securing employment. In short, what are the characteristics of the students who enter and later graduate or drop-out? Equally important, what are the characteristics of the instructors who teach these students and what are the characteristics of the curricula in which these students participate? Answers to these and similar questions are significant not only for administrators and leaders in the community colleges, but for the employers of these students as well.

The viewpoint of James Bryant Conant on new curricula is worthy of consideration. He stated that, "...The administration should be

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[9]National Manpower Council, A Policy for Scientific and Professional Manpower (New York: Columbia University Press, 1953), pp. 252-253.

ready to introduce new vocational programs as opportunities open in the community or area."[10]

What implications for the future will be revealed by this study? The rapid changes in science and technology emphasize the seriousness of trends for the future. Grant McClellan suggested some of the problems for the future when he wrote:

> The pattern of future population will present two vital problems. The first concerns the flood of young people who will place an immense pressure on educational institutions in the next twenty years, and on the labor market shortly thereafter. The second problem involves the social and individual problems posed by a rapidly expanding older group.[11]

Objectives of the study

In 1954 a book was published under the title, A Policy for Skilled Manpower. A partial view of the objectives of this study is reflected in the summary of the recommendations by the National Manpower Council as presented in these statements taken from the book. A close parallel exists between the broad objectives of this study and the five major long-range objectives which the author of A Policy for Skilled Manpower said must be pursued if we are to strengthen the nation's resources of skilled workers and technicians. These are:

1. To strengthen the contributions made by secondary education to the acquisition of skill.

2. To develop a more effective program for vocational guidance.

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[10]James Bryant Conant, The American High School Today New York: McGraw-Hill Book Co., 1959), p. 52.

[11]McClellan, op. cit., pp. 248-249.

3. To provide more equal opportunities for all individuals to acquire skill.

4. To improve the facilities and methods used to train skilled and technical manpower.

5. To increase knowledge about our manpower resources.[12]

It is hoped that the results of this study will definitely help to strengthen the total field of knowledge as stated in Number 5 above.

Delimitations of the study

Necessarily, the research will be limited in point and scope. The focal point of the study will be on industrial-technical education as practiced in the public community junior colleges of Michigan.

The characteristics of the instructors will be limited to those factors essential for an evaluation of eligibility for vocational certification as required for instructors in industrial-technical community junior college programs requesting reimbursement under National Defense Education Act, Title VIII as reported on Form 151.

The characteristics of the students will be limited to the responses of the students themselves to a questionnaire. The questionnaire will attempt to determine certain general information, the extent of educational participation, and the degree of occupational success, as well as the reactions of the students to educational and occupational environmental conditions. This part of the study will be limited to eight Michigan public community junior colleges offering

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[12]National Manpower Council, A Policy for Skilled Manpower (New York: Columbia University Press, 1954) p.4.

industrial-technical programs and accepting students in these curricula during the school year 1958-59. Graduates and drop-outs alike will be studied.

The characteristics of the curricula will be limited to those types and kinds of information available by an analysis of the catalogs or programs of curricula offerings of those Michigan public community junior colleges having sequences in industrial-technical education during the school year, 1960-61.

II DEFINITION OF TERMS USED

Meanings Applicable to This Study

Terms needing further clarification have been defined for the purpose of this study as follows:

Community college. The term "junior college" and "community college" are almost synonymous and are used interchangeably. In Michigan these institutions are legally designated as "community colleges".[13]

Cooperative work program. A program of education combined with a supervised and coordinated work experience program. The student may attend classes for one half of the time and work for the other half.

Closed-form questionnaire. A form used to secure categorized data. This form is time saving for both questionnaire and interviewing

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[13]Michigan Council of Community College Administrators, Michigan Community Colleges (Jackson: Michigan Council of Community College Administrators, 1960), p.2.

techniques, exercises a direct influence in securing responses, and greatly facilitates the process of tabulating and summarizing.

Drop-out. A person who terminates enrollment prior to graduation without completing the courses of the curriculum selected.

Equated full-time college credit. The adding up of all courses being taken by all part-time enrollees with less than 12 credits and dividing the total by 12 credits. The result so obtained is the equated number.[14]

Follow-up letter. A letter to a person who is a non-respondent for the purpose of attempting to secure a response to the questionnaire.

Industrial-technical education. This is technical education having an industrial orientation.

Junior college. This is a two-year college offering curricula both of terminal and transfer courses. The college also recognizes its objectives as related to community services, educational and vocational guidance, and adult education.

Non-resident. A person who resides outside of the boundaries of the taxing district operating the community college.[15]

Non-respondent. A member of the stratified populations studied who failed to complete and return the questionnaire form.

One-hundred per cent sample. This is a term used to designate a sample which consists of the total population.

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[14]Michigan Council of Community College Administrators, loc. cit.

[15]Michigan Council of Community College Administrators, loc. cit.

Open-end or free-response questionnaire. A questionnaire that uses essay type responses to questions. While it may provide a more adequate picture of how the respondent feels about a topic, it is more time consuming and difficult to tabulate and summarize.

Per capita operating cost. The cost of educating each yearly member (equated full-time credit student) based on operational costs only.[16]

Resident. A person residing within the boundaries of the taxing district operating the community college.[17]

Random sample. This is a sample so taken that all possible combinations have an equal chance of being drawn.[18]

Reliability. This refers to the consistency of the responses of an individual to the same question when asked at different times.

Respondent. A member of the stratified populations studied who completed and returned the questionnaire form.

Sampling the non-respondents. A random sample drawn from those who did not respond to the questionnaire after a period of time. This is used as the basis for determining whether or not those who did not respond are truly the same as those of the population who did respond to the questionnaire prior to this part of the study.

Stratified population. This is a division of the total population into smaller groups that are homogeneous in some predetermined

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[16]Michigan Council of Community College Administrators, loc. cit.

[17]Michigan Council of Community College Administrators, loc. cit.

[18]E. F. Lindquist, Statistical Analysis in Educational Research (Boston: Houghton Mifflin Co., 1940), pp. 3-4.

manner.

Technician. The widespread use of technology and mechanization has led to the growth of a group of skilled workers who understand the functioning of equipment and have the ability to detect and repair defects. These workers make up the group of technicians. They include all workers, below the level of professional engineers, who perform specialized tasks requiring a basic knowledge of principles in design, manufacturing, installation, operation, maintenance, and repair of equipment.[19]

Technical education. Technical education is the preemployment preparation of persons for technical occupations, and upgrading training for persons already employed in such occupations.[20]

Technical institute. A technical institute is a postsecondary institution whose curriculums (1) are of one to three year's duration, (2) are technological in character, and (3) emphasize understanding and application of scientific principles more than manual skills.[21]

Technological team. A term used to describe cooperative activities of several individuals in industry as the engineer, mechanic,

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[19] U. S. Department of Labor, Employment Outlook in Skilled Electrical and Electronic Occupations (Washington: Superintendent of Documents, Dec., 1955), p. 41 as cited in George L. Brandon, Twin Cities Technicians (East Lansing: College of Education, Michigan State University, 1958), p. 41.

[20] Lynn Emerson, "What is Technician Training?" School Shop, 18: 20-22, April, 1959.

[21] Leo F. Smith and Laurence Lipsett, The Technical Institute (New York: McGraw-Hill Book Company, Inc., 1956), pp. 1-5.

and technician working to attain a common objective relative to an industrial-technical job.

Terminal curricula. While this is really a misnomer, it is frequently used to describe curricula which is mainly designed to prepare the student for immediate employment rather than for transfer to another educational institution.

Total number enrolled. This is the head count of all persons enrolled for courses on the fourth Friday in the fall period. Head count is the typical enrollment figure used by U. S. colleges.[22]

Validity. This is used to describe the consistency of the research findings with data of known accuracy.

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[22]Michigan Council of Community College Administrators, *loc. cit.*

III. INVESTIGATIONAL PROCEDURES EMPLOYED

Introduction

Two main investigational procedures were employed to secure the data used in this study.

The first investigational procedure consisted of using existing sources of materials. This method was employed to secure information about the characteristics of the faculty involved in industrial-technical education, and in identifying the characteristics of the curricula in the institutions offering programs in industrial-technical education. The latter was compiled from the catalogs and brochures made available by each of the colleges. The former was secured through a study and analysis of records in the Department of Public Instruction of the State of Michigan.

The second principle method consisted in the use of a questionnaire directed to students who entered industrial-technical curriculum during the school year 1958-59 in the community junior colleges that participated in the study.

Techniques and Methods Employed

Determination of the characteristics of the teachers was enhanced by the cooperation of the Assistant Superintendent for Vocational Education of Michigan. His approval made possible a careful review and analysis of the information provided on Form 151 by each of the instructors seeking and receiving vocational certification.

The study of the characteristics of the curricula took the form of a documentary study. Copies of the catalogs and courses of study were secured and carefully studied. The analysis of this material was used in making a broad comparison of the educational emphasis of the various colleges in the preparation of students for technical occupations. Since some colleges operated on the basis of quarter-hour credits while others had semester-hour credits, the credits of all colleges were converted to semester hours for purposes of comparison.

The ground work for the portion of the study relative to the characteristics of the students was laid by the Michigan Vocational Education Evaluation Project through the cooperation of the Council of Michigan Junior College Administrators. A number of letters written by the director of the project to the administrative heads of the colleges aided to produce excellent cooperation. Each of the administrative heads or his representative provided a list of the addresses and telephone numbers as well as the names of the students composing the population of the study. The list of names of students included all those entering industrial-technical programs during the year 1958-59 since the objective of the investigation was to study students who dropped out without graduation as well as those who did complete the curricula and graduate. Some students terminated without earning a single credit; others, before the completion of the first day in college.

Questionnaire. The major instrument of research was the questionnaire. After a study of the literature, review of other questionnaires,

and discussion with the major advisor, other members of the faculty, fellow instructors and students, the first instrument was developed. This was reviewed, modified, and revised many times before the pilot instrument was used. The first pilot instrument was given to two students on a trial basis. The comments, criticisms, and reactions of the students were noted and used in making revisions. The time required for each to complete the form was recorded.

Pilot study. Thirty students were selected for the pilot-study group. The letter of transmittal together with the pilot-study questionnaire form as given in Appendix A was mailed to members of this group with a stamped, self-addressed envelope for the return of the form. Sixteen of the thirty responded. In some cases, the response was received only after repeated telephone calls. Careful study of the responses and the comments, and the apparent reactions of each of the individuals responding resulted in further refinement of the instrument.

Preparation of final form. To further validate the instrument, guidance was sought from experienced researchers. Very helpful comments and suggestions were received from some of the members of the faculty of Michigan State University, the University of Michigan, and Flint Community Junior College.

Upon approval of the content, wording, and form of the final instrument, it was released for printing.

The printed questionnaire form together with the letter of transmittals as given in Appendix B was mailed together with a stamped, self-addressed envelope to each of the students on the lists secured from the participating colleges. The initial letter of transmittal was reproduced by the multilith process and personalized by typing in the heading and salutation of the person to whom the letter was directed.

One-hundred per cent sample. While the original dissertation prospectus was based on the assumption of a random sample of approximately 34 per cent, the determination to use a 100 per cent sample was made after the size of each stratified population had been ascertained. In several cases the total size of the stratified population was so small that a partial sampling procedure would reduce the size of responses to a number inadequate for worthy statistical prediction. With the approval of the major advisor a 100 per cent sample was used instead of the 34 per cent sample as the basis for this part of the study.

Identification of respondents. Code numbers were assigned to each individual of each stratified population for purposes of identification of those who responded in order that follow-up techniques could be used to induce a large return.

Envelopes. As an aid to securing a higher per cent of returns the envelopes used for mailing the questionnaires and letters of transmittal had printed in the lower lefthand corner the words, "Important!" and "PLEASE FORWARD IF NECESSARY". The envelopes were printed with the complete return address in the upper left-hand corner. The cover envelopes were size Number 10 and the return envelopes were size Number 9. The return envelopes were printed with the investigator's name and address and were stamped prior to mailing.

Expedition of returns. With one exception, Institution 5, three mimeographed follow-up letters were used. These are given in Appendix B of this study. The list of students from Institution 5 was secured at a late date, consequently only two follow-up letters were used. Several telephone calls were made to expedite the returns.

Approximately ten per cent of the letters mailed initially were returned with notations "address unknown", "moved left no address" or "uncalled for", and approximately five per cent of these could not be subsequently located. The efforts made to trace these were through the registrars of the colleges, the telephone book and various other methods of contacts.

Shortly before the termination of the study the major advisor contacted by letter the chief administrators of the various participating colleges submitting a list of names of students whose status in the study were as yet that of non-respondents. His suggestion that someone from the college call the non-respondents was in some cases very effective. For a breakdown of the number and percentage of respondents and non-respondents see Appendix C. Even though consideration was given to the utilization of the technique of sampling the non-respondents, the percentage returns was deemed adequate so that this technique was not necessary.

Termination of collection of data. May 4, 1962 was the final day for the collection of the data from students. Approximately two months had elapsed since the first stratified population, Institution 6, was contacted. Only about one month elapsed between the initial and final contact with members of the stratified population of Institution 5.

Results in terms of response. Results in terms of the number and percentage of responses as well as the size of each stratified population is given in Appendix C.

Indicators of reliability and validity. As an indication of the reliability and validity of the study, test checks were made utilizing one of the eight stratified populations for this purpose. Stratified population Institution 6 was selected for this purpose with the following results.

The split-half test was used on Item Number 18 in relation to Item Number 44 of the final questionnaire. Both of these items asked the same question. Of the fourteen respondents to this item, twelve gave the same response in both places indicating a reliability of 85 per cent.

The split-half test was also utilized for Item Number 11-12 as compared with Item Number 44, part 2 of the final questionnaire. Both of these items related specifically to the same question. Fifty-five of the fifty-six students gave the same responses in both places for a reliability of 98 per cent.

The test-retest method was used for Item Number 9 of the pilot study as compared with Item Number 16 of the final study. To the same basic question twelve of the thirteen responses were the same in both cases for a reliability index of 85 per cent.

Another test-retest item consisted of using Item Number 15 of the pilot study in comparison with Item Number 23 of the final study. Ten of the thirteen respondents answered both items the same in both cases for a reliability index of 77 per cent.

As an indicator of the validity of the study, Item Number 15 dealing with student's grades in college was compared against the actual records in the office of the registrar. In 61 of the 86 cases the letter grade average indicated was the same. This indicates a validity index of 70.9 per cent.

CHAPTER II

REVIEW OF THE LITERATURE OF INDUSTRIAL-TECHNICAL EDUCATION

A review of the literature of industrial-technical education resulted in greater understanding and better knowledge of the basic considerations important in both industrial-technical and vocational education. Several research studies previously completed were carefully reviewed for method and content.

Books, magazine articles, and pamphlets of governmental and private organizations provided a vast source of information and data relative to the history, growth, development, and current status of the total field of vocational education and its more specialized division, industrial-technical education.

To effectively build upon previous accomplishments, it is essential that an understanding of those accomplishments are recognized. The review of the literature is intended to reflect an understanding of the importance of the educational movement, the historical development, the philosophy and practices, and significant information gained from similar studies.

Importance of the movement. The rapid growth of the labor force with an increasingly larger part of the manpower of the nation employed in some aspects of science and technology emphasizes the importance of industrial-technical education today. Howard F. Foncannon pointed out that since 1870, the labor force as a whole has increased about five

times but, employment in science and technology has increased more than eighty-five times or seventeen times as fast.[23]

Industrial-technical education is more and more being recognized as a vital force in education by persons at the local, state, and national level. With the present population explosion, and the increasing demand for technical workers possessing greater skill and knowledge, every effort must be made to improve individual competence and develop the talents of every worker to the fullest extent. This concept is presented in the booklet, Manpower Challenge of the 1960's as follows:

> We must strive to place every worker in a job that best fits his talents and then press for full use of these talents on the job.
> We must use all our manpower resources without regard to race, sex, age or physical handicap.
> We must plan on full use of better quality as well as increasing quantity of manpower.[24]

The contribution of industrial-technical education is not only significant for a peace-time economy but, it may be the factor which provides the added advantage in our present world situation. As T. A. Hippaka has stated, "today's world totters perilously on the verge of chaos that can hardly be imagined, held in place by a balance of terror between giant superpowers, Russia and the United States."[25]

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[23]Howard F. Foncannon, Trends in the Employment and Training of Scientists and Engineers, National Science Foundation, Circular NSF-56-11 (Washington: Government Printing Office, 1956), p. 4.

[24]- - -Manpower Challenge of the 1960's, (Washington: Government Printing Office, 1960), p. 22.

[25]T. A. Hippaka, "Education for Peace," Industrial Arts and Vocational Education, 47: 84-92, March, 1958.

Vocational education. Learning to work is a simplified statement describing vocational education. Roy Roberts has stated this in his book. He said, "the history of vocational education is the history of man's efforts to learn to work."[26] But it was George H. Ferns who pointed out that, "the honor and dignity of work were basic in the creed of the founders of the American democracy."[27]

Vocational education is a kind of education whose purpose is to teach individuals to work and to perform useful services for society. As expressed in the book, Course Construction in Industrial Arts and Vocational Education, "vocational education presupposes that the student is beyond the exploratory state and that his special interests are from the occupational standpoint only."[28]

Is vocational education important? John A. McCarthy has clearly expressed how significant he thinks vocational education is in our society today when he wrote:

> Vocational education -- and this includes the facilities of private and public trade schools as well as the training facilities of industry and commerce -- thus constitutes America's greatest resource. Without these training facilities, our raw materials are of little value; our ability to cope with any aggressor nation would be pitifully limited; and the level of craftsmanship and effective

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[26]Roy W. Roberts, Vocational and Practical Arts Education (New York: Harper & Brothers, Publishers, 1957), p. 33.

[27]George H. Fern, What is Vocational Education (Chicago: American Technical Society, 1945), pp. 7-9.

[28]J. W. Giachino and Ralph O. Gallington, Course Construction In Industrial Arts and Vocational Education (Chicago; American Technical Society, 1954), p. 54.

> citizenship in our occupational democracy would be disastrously lowered.[29]

Herbert Hoover and Dwight D. Eisenhower both recognized the value of vocational education. When Herbert Hoover was Secretary of Commerce, he once said that, "we in this country believe that education pays for itself and is worthwhile and if this is true of any sort of education it is certainly true of vocational education."[30] Dwight D. Eisenhower recognized the contribution of vocational education when he stated that, "the wealth of the world is created by the work of skilled hands on raw materials."[31]

Franklin Keller has characterized vocational education in very exciting and vivid terms. His realistic summary of the philosophy of vocational education is worthy of study by all Americans.

> Vocational education is not something presented to or done for young people or for men and women. It is an opportunity for vibrant, eager, growing human beings to do something they want to do for themselves. ...Vocational education is concerned with every vocation. ...The key words are purpose, diversity, unit, democracy, service, and work. The greatest of these is work. ...Modern vocational education for all vocations -- industrial, agricultural, commercial, professional -- comprises not only performance and theory but the whole life of the worker.[32]

Vocational education is an inclusive term. Industrial education

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[29] John A. McCarthy, Vocational Education: America's Greatest Resource (Chicago: American Technical Society, 1951), p. viii.

[30] Byram, Harold M. and Ralph Wenrick, Vocational Education and Practical Arts in the Community School (New York: The MacMillan Co., 1956), pp. 39-50.

[31] Ibid.

[32] Franklin J. Keller, Principles of Vocational Education (Boston: D. C. Heath and Co., 1948), pp. 4-36.

is a part of vocational education. The place of vocational education in maintaining the prosperity of the nation is excellently described by George Fern. He wrote that, "the nation's greatest resource, in peace as well as war, is the skill of the craftsmen. Without that skill the 'wheels of industry' move hesitantly in spite of today's amazing mechanical improvements and inventions."[33]

Industrial education. Frank Dalton,[34] Arthur Mays[35] and several others have written about the place of industrial education in the total sphere of vocational education. In fact an abundant number of references are available in the review of the literature 'high-lighting' the historical development, philosophy, practices, and present trends in industrial education.

Are the educational institutions meeting the challenge of providing adequate opportunities for those interested in industrial education? A recent study made in Ohio emphasized that:

> ...Ohio is an industrial state as indicated by the fact that 40.3 per cent of her employed population are working as skilled workers and technicians. Yet it is found that only 5.4 per cent of the eligible high school enrollment in Ohio is provided preparation for entrance into skilled fields.[36]

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[33]Fern, op. cit., p. 50.

[34]Frank W. Dalton, The Development of Industrial Education in Michigan (Ann Arbor: The Michigan Industrial Education Society, 1940), p. iii.

[35]Arthur B. Mays, Essentials of Industrial Education (New York McGraw-Hill Book Company, Inc., 1952), pp. 4-175.

[36]- - - Meeting Ohio's Needs for Vocational and Technical Education (Columbus: Ohio State University, 1957), p. iv.

A few years ago the Department of Public Instruction of Michigan in one of its brochures strongly suggested a more realistic relation between the emphasis of education and the positions of a majority of the labor force. The following quotations are indicative of this point of view expressed in the brochure:

> ...Approximately 65% of Michigan's labor force is employed in trade and industrial occupations. The workers in this general area are distributed as follows: supervisory, 6%, technical, 1%, skilled, 19%, semiskilled, 53%, and unskilled, 21%. ...Approximately 50% of Michigan's youth do not complete high school, and most of those who do have received a college preparatory academic program. Education must improve and change its program to meet better the needs of youth who will enter trade and industrial occupations.[37]

While additional study is necessary to determine whether the needs at the present time are the same as indicated above, it is certainly important to recognize the fact that persons in positions of leadership in various parts of the United States are concerned about the effectiveness of the present offerings in meeting the occupational needs of individuals.

Considering this background of information, it was quite natural that industrial-technical education should come more and more into focus. In Michigan the community junior colleges during the latter 1950's and early 1960's assumed the role of providing opportunities for post-high school students to acquire industrial-technical education of the type commonly considered technological education or technician

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[37]Trade and Industrial Education Division, Office of Vocational Education, Department of Public Instruction, _Recommendations for Trade and Industrial Education Service in Michigan Public Schools_ (Lansing: Department of Public Instruction, May 24, 1950), pp. 1-2.

training.

What is a technician? Much has been written recently about technicians, their education and job activities. The term technician still means many different things to different people. In examining the literature on this subject some very interesting statements are found. While many writers have defined the word technician, two of these definitions are especially useful for this study. Lynn Emerson provides the following definition:

> A general term applied to an individual who assists with technical details in a trade or profession. Uses tools, instruments, and/or special devices to design, illustrate, fabricate, maintain, operate, and test objects, materials, or equipment. Performs mathematical and scientific operations reporting on and/or carrying out a prescribed action in relation to them. Examines and evaluates plans, designs, and data; determines action to be taken on the basis of analysis; assists in determining or interpreting work procedures and maintains harmonious relations among groups of workers.[38]

George L. Brandon, in his study, Twin Cities Technicians, used as the definition the same one employed by the U. S. Department of Labor in its publication, Employment Outlook in Skilled Electrical and Electronic Occupations. This very practical working concept of the term follows:

> The widespread use of technology and mechanization has led to the growth of a group of skilled workers who understand the functioning of equipment and have the ability to detect and repair defects. These workers make up the job group of technicians. They include all workers, below the level of professional engineers, who perform specialized tasks requiring a basic knowledge of principles in

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[38]Lynn A. Emerson, Vocational-Technical Education for American Industry (Circular Number 530. Washington: United States Government Printing Office, 1958), pp. 1-2.

design, manufacturing, installation, operation, maintenance, and repair of equipment.[39]

Additional study of the literature provides further characteristics of the job of the technician. According to K. C. Cummings the job of the engineering aide is subdivided according to (1) type of industry, (2) type of engineering performed, and (3) the work itself.[40] However, C. J. Freund explained the great variation in the work of technicians from job to job and from one plant to another by explaining that the engineers in one plant or corporation perform tasks which technicians perform in another plant or corporation.[41] The relative position of the technician to the engineer and the craftsman as a member of the team has been stated as follows, "the technician holds a key spot between the engineer and the craftsman in industry, between theory and production. ... He turns the ideas and theories of the engineer into mass-produced items."[42]

What degree of intelligence is most desirable for a person to be

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[39]U. S. Department of Labor, Employment Outlook in Skilled Electrical and Electronic Occupations (Washington: Superintendent of Documents, December, 1955), p. 41 as cited in George L. Brandon, Twin Cities Technicians (East Lansing: College of Education, Michigan State University, 1958), p. 41.

[40]K. C. Cummings, "Characteristics of the Technician as an Engineering Aid," Journal of Engineering Education, 47: 443-50, Jan., 1957.

[41]C. J. Freund, "The Technician and the Engineer," Journal of Engineering Education, 44: 108-9, October, 1953.

[42]National Association of Manufacturers, Your Opportunities in Industry (New York: National Association of Manufacturers, 1957), pp. 7-8.

a successful technician? One of the references describes a small statistical check which was performed on the correlation between job performance and certain inherent personal characteristics. This firm carefully rated a group of fifty engineering and research technicians by their supervisors and divided them into two groups as to performance: above average, and below average. Then the raw scores of these men on the Otis General Ability test were checked. While the results of this study may not be conclusive, it did indicate that, "technicians who scored between 100-125 on the Otis test were more likely to be good technicians then those who scored higher than 125 or below 100."[43]

As has been indicated there are many different definitions of technicians. There are also several different kinds of technicians and the educational requirements for these different kinds of technicians vary considerably. A detailed study of the educational requirements for engineering technicians by G. Ross Henninger suggested that:

> ... The engineering technician does not need to have either the depth or the extent of mathematical or scientific understanding required by the engineer. However, the engineering technician does need to have a practical working understanding of essentially the same subject matter. ... The engineering technician does need to have a general working knowledge and appreciation of the manufacturing or operational manual skills related to his area or occupational and subject-matter interest.[44]

The applications of knowledge of technicians have been contrasted

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[43]Cummings, loc. cit.

[44]G. Ross Henninger, "Functions of the Engineering Technician in Industry" (Paper read at the American Society for Engineering Education, Detroit, Michigan, May 9, 1959), p. 3.

with those of engineers by C. J. Freund as follows:

> The engineer understands principles and fundamentals of mathematics, physics, and chemistry. He uses his knowledge in research, design, and development. The technician likewise knows mathematics, physics, and chemistry. But, he uses his knowledge to perform calculations, run tests, make estimates, and prepare diagrams.[45]

Diligent study of the literature and review of the curricula of many institutions has firmly established the conviction that the kind of education technicians need must be an outgrowth of the basic needs of industry, identified objectives, kinds of technology, and degree of involvement in engineering and scientific principles. Constant attention must be given to the changing needs of industry. Extensions of science and technology have produced the need for greatly upgraded engineering levels of work. This in turn has resulted in a shortage of workers prepared to function at the level at which engineers were previously functioning. Ralph J. Smith discussed this concept in his book by explaining, "the new technicians are performing work which 20 years ago would have been performed by the engineer."[46]

Most sources are in agreement that more and better education for technicians is essential if industry is to be provided with an adequate supply of skilled and qualified employees. Statistics vary from industry to industry and from firm to firm as to the best ratio of technicians to engineers. While the present average ratio is less than 1:1 some authors have expressed the point of view that industry could effectively

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[45] Freund, loc. cit.

[46] Ralph J. Smith, Engineering as a Career (New York: McGraw-Hill Book Company, Inc., 1956), p. 118.

utilize five technicians for each engineer. Manpower statistics clearly indicate that the demand for technicians is steadily increasing.

The technological team. Industry, more and more has developed the team concept. One of these teams has been described as the "technological team". While differences seem to exist in the interpretation of the importance and contribution of the various members of the team, the following are typical of the ideas expressed in the literature on this subject.

> There is increasing recognition of the trio of skills required for the manufacturing and proper maintenance of electronic, and electro-mechanical devices. This requires the:
> 1. Engineer with his thorough training in mathematical, physical, and engineering science.
> 2. Mechanic (machinist or assembler) with his skill for fabricating products in conformance with engineering drawings.
> 3. Technician, who combines some knowledge, experience and skill of both the engineer and the mechanic.[47]

In the words of Henry H. Armsby, "this technological team is chiefly responsible for the existance in the United States of the highest standard of living the world has ever known."[48] Technicians make an important contribution to the technological team. In fact many jobs can be performed better by technicians than by engineers, especially in laboratories and shops where manipulative skill is involved. In a recent article, Hertensteen stated, "a technician's understanding of

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[47] Earl MacCormac, "Industry Takes a Look at Industrial," American Vocational Journal, 33: 22-23, February, 1958.

[48] Henry H. Armsby, "Technological Team; Most Valuable National Resource," School Life, 37: 58-9, January, 1955.

hardware, production, and maintenance methods make him valuable on the engineering team."[49]

Meeting the needs for technicians. Even though technicians are being educated this year in larger numbers than a few years ago, the enrollment of technicians is not adequate to meet the increasing demand. Armsby states that the enrollment of technicians in 1954-55 was 50,300. This was a 12% increase over the previous year.[50]

Information relative to the number of students participating in training programs under Title VIII of the National Defense Education Act of 1958 is provided in the Technician Education Yearbook 1963-64. "Nearly 150,000 men, women, and school youth were enrolled in 1962 in 630 institutions. ... This represents a three-fold increase since 1959, when the first programs began."[51]

The number of persons working as technicians in 1963 as compared with 1940 is an indication of the rapid growth in this field. According to figures of the National Science Foundation, 300,000 persons worked as technicians in 1940; 550,000 in 1950; 875,000 in 1960; and 1,000,000 at the end of 1963. The official estimate for 1970 is 1,600,000 persons working as technicians in the United States.[52]

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[49] H. N. Hertensteen, "What Happens to Technicians?" American Vocational Journal 32:31, April, 1957.

[50] Armsby, loc. cit.

[51] --- Technician Education Yearbook 1963-1964 (Ann Arbor: Prakken Publications, Inc., 1963.

[52] Ibid.

A few years ago Kahler and Hamburger described the lack of education for the skilled labor force as follows, ... the United States is replenishing scarcely half of its total skilled labor force. ...Four per cent of the children in secondary schools are attending industrial or trade schools."[53] While definite shortages still exist in many fields of technical occupations, the effects of recent legislation seems to be beneficial in easing the critical shortages.

Literature of technical institutes. To supplement a large number of magazine articles and bulletins devoted to the various aspects of the technical institute, the book by Smith and Lipsett, The Technical Institute, was studied. This book describes the historical development, the philosophy and practices of technical institutes, as well as identifying potential students. A picture of the scope of technical education is suggested by the fact that in 1954-1955 a total of 347 different curriculums was offered. ... The curriculums most frequently reported were those in electrical technology. ... In 1954 a total of 9,132 students graduated from technical institute curriculums.[54]

The result of the intensive study conducted by G. Ross Henninger was reported in the book, The Technical Institute in America. This was

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[53]Kahler and Hamburger, Education for an Industrial Age as cited in Trade and Industrial Education Division, Office of Vocational Education, Department of Public Instruction, Recommendations for Trade and Industrial Education Service in Michigan Public Schools (Lansing: Department of Public Instruction, May 24, 1950), pp. 1-2.

[54]Leo F. Smith and Laurence Lipsett, The Technical Institute (New York: McGraw-Hill Book Company, Inc., 1956), pp. 1-247.

a study of the technical institutes, the students, curricula, and industrial opportunities for technicians. Among several conclusions derived by Henninger, one relates to the significance of technical education. He stated that, "the technical institute curriculum is aimed principally at the development of intellectual capacity, supplemented by development of directly related manual skills."[55]

Literature relative to community junior college. The rapidly growing junior college movement has reached the point where one student in four begins his program of higher education in the United States in a junior college. James W. Thornton, Jr. reported in his book that according to the Junior College Directory, 677 junior colleges were in existence in 1960 having an enrollment of 905,062 students.[56]

Seashore in tracing the historical development of the junior college movement, described it as, "the most significant mass movement in higher education that this or any other country has ever witnessed in an equal period of time."[57]

Dr. James Bryant Conant, former president of Harvard University, recommended that the expansion of our college system in the next decade

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[55]G. Ross Henninger, The Technical Institute in America (New York: McGraw-Hill Book Company, Inc., 1959), pp. 1-148.

[56]Edmund J. Gleaser, Jr., Junior College Directory, 1960 (Washington: American Association of Junior Colleges, 1960) as cited by James W. Thornton, Jr., The Community Junior College (New York: John Wiley & Sons, 1960), p. v.

[57]Carl E. Seashore, The Junior College Movement (New York: Henry Holt and Company, 1940), p. 1.

should be almost exclusively at the two-year level.[58]

Dr. John Dale Russell, speaking before the national convention of the American Association of Junior Colleges said, "the development of an adequate system of junior colleges will be the best method of maintaining universities at a reasonable size."[59]

Dr. George D. Stoddard, formerly president of the University of Illinois, once stated, "... if a full community college program of the type we are advocating, were established along academic, recreational, artistic, and vocational lines, 80 per cent of our high school graduates would enter."[60]

Philosophy and function. As has been described by Tyrus Hillway, the philosophy of the modern two-year college centers around:

1. The democratization of higher education through the extension of greater opportunity to all youth.
2. Community service.
3. Vocational training for the semiprofessions.
4. More effective adult education.
5. Guidance and rehabilitation.[61]

Jesse P. Bogue and LeLand L. Medsker as well as many others concurred in the basic functions of the two-year college. Jesse P. Bogue called attention to the place of the junior college in the American

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58 James A. Starrak and Raymond M. Hughes, The Community College in the United States (Ames: The Iowa State College Press, 1954), p. 21.

59 Ibid., pp. 21-22.

60 Ibid., pp. 54-55

61 Tyrus Hillway, The American Two-Year College (New York: Harper & Brothers, 1958), p. 83.

plan of education when he suggested a thorough examination of life situations and a study of the identifiable problems that need solution on the local, state and national level as related to the basic functions of community colleges.[62] Medsker describes the junior college as, "... bringing higher education to the students' own doors."[63]

Industrial-technical education. Industrial-technical education is a part of vocational education and one of the five goals of the junior college. Tyrus Hillway places vocational education in perspective in these words:

> Since the liberal arts college no longer considers vocational or special education as its proper function and since training for the professions is now provided by the professional schools, the junior college has been left with responsibility for special education in those fields requiring more training than the high school can give and yet less than that usually required for the recognized professions. These are precisely the fields in which employment has risen in the most noticeable degree during the past three-quarters of a century.[64]

Industrial-technical education in the junior colleges is part of the content of a book by Phebe Ward, Coordinator for Terminal Education at San Francisco Junior College. The first part of the book presents an over-all view of the philosophy of terminal education, curriculum, and student personnel services. The second part provides a detailed examination of the activities as community services and resources,

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[62]Jesse Parker Bogue, The Community College (New York: McGraw-Hill Book Company, Inc., 1950), p. 76.

[63]Leland L. Medsker, The Junior College: Progress and Prospect (New York: McGraw-Hill Book Company, Inc., 1960), p. v.

[64]Hillway, op. cit., pp. 105-11.

cooperative work programs, student guidance, testing and follow-up and evaluation as developed and carried out in nine junior colleges. Phebe Ward states that the junior college program must be built upon a careful analysis of the needs of the community with constant reappraisal of the occupational trends.[65]

Michigan community junior colleges. As the numbers of students in Michigan of college age increased rapidly due to the high birth rate following the second World War, the public community junior colleges of Michigan became more and more important as institutions of higher education. A study of the literature of the Michigan Council of Community College Administrators as released in 1960 indicated that:

1. If one considers only public colleges and universities, 41% of all freshmen enrolling for the first time in higher education came to the 16 Michigan community colleges in 1959.
2. Twenty-five per cent of first-time enrolled freshmen at all Michigan colleges and universities enrolled at our community colleges according to Michigan Department of Public Instruction data.
3. Sixteen per cent of Michigan's college and university students enrolled in 1959 in the sixteen community colleges.[66]

Introduction to selected studies. Several studies were carefully reviewed both for method and content significant to the current study. The "high-lights" of these studies were included as a background for

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[65]Phebe Ward, Terminal Education in the Junior College (New York: Harper & Brothers Publishers, 1947), pp. 6-7.

[66]William N. Atkinson, Michigan Community Colleges (Jackson: Michigan Council of Community College Administrators, 1960), pp. 2-6.

this thesis. The studies reviewed first are those from other states.

Improving Vocational Education in Rhode Island. This was a study of the vocational education needs in the fields of agriculture, business, guidance, home economics, and trades and industry. Recommendations were made for improving state leadership and service as well as for providing adequate financial support.[67]

Vocational Education Needs in Lane County. The basic purpose of the study was to ascertain the most important needs for vocational education in the area. Consideration was given to public relations, counseling and placement. Revision of present courses and the appointment of occupational subcommittees were studied.[68]

Vocational and Technical Education in Illinois. In the words of this study, the objectives were identified specifically as:

> The purpose of the study is to examine the broad range of vocational education in the public schools, beginning with the programs in the high schools and extending to the more specialized or technical programs beyond the high schools. The study is concerned not only with programs for training youth but also with programs for educating adults.[69]

This study was concerned about occupational education in the

67- - - *Improving Vocational Education in Rhode Island* (Providence: Rhode Island State Department of Education, 1950), p. 5.

68Eugene School District #504-C, *Vocational Education Needs in Lane County* (Eugene: Eugene School District #504-C, 1957), p. ix-x.

69William P. McLure, *Vocational and Technical Education in Illinois* (Springfield: Office of Superintendent of Public Instruction, 1960), pp. 3-133.

junior colleges. It was also concerned about a unified system of education for Illinois which would eliminate the piecemeal status of technical education. As a conclusion of the study a recommendation was made for a system of junior colleges designed to serve both the transfer and the occupational needs of potential students.

Report of a Study of General Education Programs in Community Junior Colleges. While this study was basically designed to reveal the characteristics of community junior college academic programs as related to general education, some references were made to terminal education. The study included community junior colleges in various parts of the United States reporting the results of the findings from those 137 colleges participating. Some statements significant for persons concerned with occupational curricula follow:

1. Thirty-five per cent of the public community junior colleges responding offered cooperative work-study terminal programs.
2. The median per cent of the student body in terminal curricula for all respondents was 20% in the public community colleges.
3. A median of 5% of the student body that graduated from a terminal curricula transferred to a senior college.
4. Seventy-eight per cent of the public community junior colleges indicated that they did not place terminal students in separate homogeneous classes in general education courses.
5. Thirty-six per cent of the public community colleges indicated that different courses are taught in the same subject matter fields for terminal programs than for transfer programs.
6. Sixty-nine per cent of the public institutions responding indicated that their terminal students are accepted with full credit given for their community junior college terminal general education upon transferring to a senior college.[70]

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[70]William G. Dwyer, Report of A Study of General Education Programs in Community Junior Colleges (A study under the direction of Max Smith, Michigan State University, Middletown: Curriculum Commission of the American Association of Junior Colleges, 1960), pp. 1-17.

The Community College in Michigan. This was part of the "Survey of Higher Education in Michigan" prepared for the Michigan Legislative Study Committee on Higher Education. Several recommendations mentioned the junior colleges and occupational programs. The report emphasized the need for more organized occupational programs to "fill the gap" in the structure of higher education in Michigan. The report recognized the community junior college in Michigan as the best potential source of occupational education and strongly recommended that the most direct answer to its needs at this time appeared to be a strengthening and expanding of the community college movement in the state.[71]

Twin Cities Technicians. This was a survey of technicians in the Benton Harbor-St. Joseph area. The study indicated the nature of the work of the technicians and suggested the type of desirable related instruction for these work activities.[72]

Vocational-Terminal Education in the Public Community Colleges of Michigan: Its Present and Its Future. As a part of the requirements for the Doctor of Education degree at Wayne State University in 1956, this study was made of vocational-terminal programs offered in the Michigan public community colleges. A conclusion implied that many of

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[71]S. V. Martorana, The Community College in Michigan (Staff Study Number 1, The Survey of Higher Education in Michigan, Lansing: Michigan Legislative Study Committee on Higher Education, 1957), pp.3-7.

[72]George L. Brandon, Twin Cities Technicians (East Lansing: College of Education, Michigan State University, 1958), pp. vi-vii.

the terminal engineering aide programs were simply "watered down" versions of college transfer engineering programs. Another statement in the recommendations indicated the need for administrative assistants in the community colleges with broad understanding of vocational-terminal education.[73]

Educational Program and Administrative Survey -- Flint Community Junior College. Booz, Allen, and Hamilton, in an intensive study of the entire operation of the Flint Community Junior College, devoted considerable attention to the occupational curricula offered in the Department of Applied Sciences. Attention was called to the need for clarification of the basic objectives of the occupational curricula, increasing the emphasis on this curricula, and offering courses uniquely designed for the education of technicians. Included in the recommendations were greater emphasis on practical applications, and the development of such instructional methods as essential to provide opportunities for design, production, and construction.[74]

Analysis of Institutional Objectives in Michigan Community Colleges. This was another study in partial fulfillment of the doctor's degree at Michigan State University. The purpose of the study

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[73]D. R. Sherman, "Vocational-Terminal Education in the Public Community Colleges of Michigan: Its Present and Its Future" (Summary of the unpublished Doctor's thesis, Wayne State University, Detroit, 1956), pp. 5-8.

[74]Educational Program and Administrative Survey (A study of Flint Community Junior College, Chicago: Booz, Allen, Hamilton, 1961), pp. 74-95.

was to conduct an analysis of the objectives of the community colleges of Michigan and to determine relationships existing between the perceptions of teachers and those of administrators in selected community colleges of Michigan.[75]

A Follow-Up Study of Students Graduating from the Applied Science Curricula at Flint Community Junior College. The purpose of the study was to obtain information concerning types of employment, location of employment, and other significant current information about the graduates of the Applied Sciences Department. The study was completed in 1961 by the Department of Student Affairs of the college. The findings indicated that most graduates were satisfied with their current employment and that the education received at college helped them to obtain their present employment.[76]

Results of Graduate Survey, Flint Community Junior College. This was a follow-up study conducted by two instructors of the department as part of the requirements of a graduate course at the University of Michigan. This study was concerned with those persons who graduated from the department up to and including 1959. Conclusions of the

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[75]John Robert Kimball, "Analysis of Institutional Objectives in Michigan Community Colleges" (unpublished Doctor's thesis, Michigan State University, East Lansing, 1960), pp. 1-3.

[76]James E. Lorion, "A Follow-Up Study of Students Graduating from the Applied Science Curricula at Flint Community Junior College" (Flint: Flint Community Junior College, April 24, 1961), p. i.

study indicated that two-thirds of the graduates were employed within a thirty-mile radius in employment directly related to their college training.[77]

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[77] Jacob L. Burger and Edmund N. Kogut, "Results of Graduate Survey, Flint Community Junior College, Department of Trades and Industry" (Flint: Flint Community Junior College, 1959).

CHAPTER III

CHARACTERISTICS OF THE TEACHER

It was the purpose of this study to identify the characteristics of the faculty of Michigan community junior colleges who teach industrial-technical subjects to students in terminal curricula.

The information in the tables was gathered from the records of the Department of Public Instruction (DPI) at Lansing, Michigan during August, 1961.

In order to provide anonymity to the individual community junior colleges, the institutions are identified by number only.

All of the data relates to instructors, coordinators, and/or supervisors certified by the Michigan DPI to teach industrial-technical subjects during the school year 1960-61 in programs being partially reimbursed in accordance with the provisions of the National Defense Education Act (NDEA) under Title VIII.

Number of teachers. The number of certified teachers in each of the eleven public community junior colleges of Michigan that qualified for NDEA, Title VIII reimbursement is given in Table I. The percentage of the total employed by each of the participating colleges is given as an aid in understanding the relative emphasis this type of program has received in the various participating colleges. The information provided was selected from the most recent school year for which complete information was available, 1960-61.

Over 75 per cent of the instructors were employed by five of the institutions. Two of the institutions employing the largest number of instructors had nearly 50 per cent of the faculty members teaching in this field. The composite total of instructors employed by the six smallest institutions was less than the number employed by the one

TABLE I

NUMBER AND PERCENTAGE OF INSTRUCTORS AND COORDINATORS OF INDUSTRIAL-TECHNICAL CURRICULA TEACHING IN THE N.D.E.A. TITLE VIII PROGRAMS IN THE FOLLOWING INSTITUTIONS DURING 1960-61

Institution	Number employed	Per cent of total number
1.	3	2.17
2.	5	3.62
3.	27	19.56
4.	6	4.34
5.	14	10.15
6.	42	30.44
7.	5	3.62
8.	9	6.53
9.	13	9.43
10.	4	2.89
11.	10	7.25
Total	138	100.

institution utilizing the largest number of certified instructors.

Amount of education of instructors. Table II shows the amount of education of each of the 138 instructors who taught industrial-technical courses. The education of the instructors as contained on the application for vocational certification and retained in the files of the Superintendent of Public Instruction has been classified into seven categories. The categories indicated in Table II are as follows: Less than bachelor's degree, bachelor's degree, bachelor's degree plus, master's degree, master's degree plus, doctor's degree, and no information given. An analysis of the data indicated that the median of the 138 instructors from the point of view of educational status was in the master's group. Twenty-three per cent of the instructors had earned master's degrees and another group of 23 per cent had earned more than the master's degree but had not received the doctor's degree.

Major subject matter areas of instructor's education. The various subject majors of these instructors is presented in Table III. This table makes apparent the number having earned each of the various degrees. Most of the instructors having master's degrees selected majors in either education or industrial education. Two other substantial groupings earned master's degrees in industrial arts and in vocational education. Forty-one of the 59 teachers receiving master's degrees, received education-oriented degrees.

The single largest group from the point of view of subject majors earned the bachelor's degree in the field of industrial arts. This fact

TABLE II

THE AMOUNT OF EDUCATION INDICATED BY THE INSTRUCTORS OF INDUSTRIAL-TECHNICAL CURRICULA AT THE TIME OF THE MOST RECENT VOCATIONAL CERTIFICATE RENEWAL

Inst.	Less than bachelor's degree	Bachelor's degree	Bachelor's degree plus	Master's degree	Master's degree plus	Doctor's degree	No information
1.	0	0	0	1	2	0	0
2.	0	0	0	3	2	0	0
3.	1	3	5	9	4	1	4
4.	0	1	2	1	2	0	0
5.	2	1	9	2	0	0	0
6.	1	8	6	10	16	1	0
7.	0	2	1	1	1	0	0
8.	2	3	2	2	0	0	0
9.	0	3	1	2	3	0	4
10.	0	0	2	0	2	0	0
11.	3	4	2	1	0	0	0
Total (138)	9	25	30	32	32	2	8
Per cent (100)	6.53	18.12	21.74	23.19	23.19	1.44	5.79

TABLE III

DEGREES EARNED AND MAJOR SUBJECT MATTER AREAS OF INSTRUCTORS OF INDUSTRIAL-TECHNICAL CURRICULA DURING THE SCHOOL YEAR 1960-61

Subject of major	Bachelor's Degree	Master's Degree	Doctor's Degree
Architectural Engineering	1	0	0
Biology	1	0	0
Business Administration	2	0	0
Business Education	1	0	0
Business Management	1	0	0
Chemistry	8	2	0
Chemistry-Mathematics	1	0	0
Civil Engineering	3	1	0
Counseling and Guidance	0	2	0
Drafting and Design	2	0	0
Economics	1	0	0
Education	3	17	0
Electrical Engineering	4	0	0
Electricity-Mathematics	1	0	0
Electricity-Science	1	0	0
Electronics	1	0	0
English	3	2	1
Foresty	1	0	0
Industrial and Engineering Education	0	1	0
Industrial Arts	32	6	0
Industrial Education	7	10	0
Industrial Engineering	3	0	0
Industrial Supervision	1	0	0
Mathematics	12	4	0
Mathematics-Physics	2	0	0
Mathematics-Science	4	0	0
Mechanical Arts	2	0	0
Mechanical Engineering	6	1	0
Metallurgy	1	0	0
Physics	3	0	0
Physics-Chemistry	2	0	1
Physical Science	1	2	0
Psychology	1	0	0
Psychology-Education	1	1	0
Sanitary Engineering	0	1	0
Speech-Political Science	0	1	0
Social Science	1	0	0
Vocational Education	5	8	0
Total	119	59	2

suggests the possibility that the public community junior colleges benefited from the experiences of industrial arts trained teachers who may have taught in the high schools prior to employment at the community junior college level. Other subject matter areas were also well represented. For instance, 12 of the 119 instructors had bachelor's degrees in mathematics. Further examination indicates that several of the teachers had mixed majors such as science and mathematics, or physics and mathematics.

It is only reasonable to expect that some of the teachers in industrial-technical curricula may have been recruited from industry or directly from the engineering colleges of the universities. Study of Table III shows that six instructors earned bachelor's degrees in mechanical engineering, four in electrical engineering, and five in civil engineering.

A total of 38 different subject matter fields was represented within the industrial-technical faculty.

Teacher education. The extent to which the instructors of industrial-technical subjects have gained preparation in the techniques and methods of teaching is indicated in Table IV. It was necessary in some cases to equate quarter hours with semester hours to provide a common base of comparison. While the practice has been followed in this table of indicating the hours earned in increments of 12, an exception has been made in the third column from the left. This column gives the number of instructors having earned exactly 12 semester hours

TABLE IV

NUMBER AND PERCENTAGE OF SEMESTER HOURS IN PROFESSIONAL VOCATIONAL EDUCATION IN THE CATEGORIES LISTED BELOW INDICATED BY THE INSTRUCTORS OF INDUSTRIAL-TECHNICAL CURRICULA AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Inst.	Semester Hours								Total
	None or None Given	1-11 (Inc.)	12	13-24	25-36	37-48	49-60	Over 60	
1.	2	0	0	0	1	0	0	0	3
2.	1	0	0	1	3	0	0	0	5
3.	21	2	1	2	0	0	1	0	27
4.	1	3	0	2	0	0	0	0	6
5.	2	3	3	5	0	1	0	0	14
6.	13	6	2	13	2	4	2	0	42
7.	1	2	1	0	0	1	0	0	5
8.	6	2	0	1	0	0	0	0	9
9.	9	0	0	3	1	0	0	0	13
10.	2	0	0	1	1	0	0	0	4
11.	2	3	2	3	0	0	0	0	10
Total	60	21	9	31	8	6	3	0	138
Per Cent	43.47	15.22	6.53	22.47	5.80	4.34	2.17	0	100

in professional courses in education. This is a significant number because of certification requirements in Michigan.

Further investigation may be necessary as the instructors may not have listed all of the desired information on Form 151 since over 43 per cent of the instructors indicated no semester hours earned in courses in teaching methods and related subjects. Sixty-five per cent of the instructors had 12 or less semester hours in this kind of academic course work.

Approximately 21 per cent had earned more than 24 semester hours in professional vocational education courses.

Considering the total number of instructors in the industrial-technical curricula as a population, the median was in the 1-11 semester hour group in professional vocational education courses with the mid-point at approximately 6 semester hours.

Technical preparation. Table V indicates the preparation of the instructors from the point of view of semester hours earned in basically technical courses.

Additional investigation may be necessary as it appeared that some of the applicants may have omitted desirable information from Form 151 as it is difficult to believe that 40 per cent of the instructors had no formal preparation in the technical fields as indicated by their completed Form 151.

The median falls in the 13-24 semester hour group with a midpoint of 18 semester hours.

TABLE V

NUMBER AND PERCENTAGE OF SEMESTER HOURS IN COURSES OF TECHNICAL CONTENT INDICATED BY THE INSTRUCTORS OF INDUSTRIAL-TECHNICAL CURRICULA AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Inst.	Semester Hours							Total
	None or none given	1-12 (Inc.)	13-24	25-36	37-48	49-60	Over 60	
1.	0	1	0	1	0	1	0	3
2.	2	0	0	1	2	0	0	5
3.	17	0	2	2	1	2	3	27
4.	0	0	0	1	0	3	2	6
5.	5	1	4	2	1	0	1	14
6.	13	3	3	4	5	7	7	42
7.	1	0	0	3	0	1	0	5
8.	8	0	0	1	0	0	0	9
9.	7	0	2	0	0	3	1	13
10.	0	0	0	1	2	0	1	4
11.	5	1	2	2	0	0	0	10
Total	58	6	13	18	11	17	15	138
Per cent	42.03	4.34	9.42	13.05	7.97	12.32	10.87	100

Institutions granting instructor's degrees. Table VI has been divided into two parts. In the first part is a list of the out-of-state colleges and universities from which the faculty members have received degrees. The second part lists the state institution granting degrees to the instructors of industrial-technical subjects.

The out-of-state institutions most frequently mentioned as the source of bachelor's degrees were Stout State College, Purdue University, Bowling Green State University, and the University of Minnesota. The largest single group of those having earned master's degrees out-of-state, earned them at the University of Minnesota. Many institutions were represented in both degree groups. The one out-of-state Ph. D. was from Carnegie Institute of Technology.

Two out of every 3 instructors earned the B. A. and the M. A. degree from Michigan. Western Michigan University, Michigan State University, and Central Michigan University, in the order named, were the main state sources of B. A. degrees. On the graduate level, the University of Michigan supplied 29 of the M. A. degrees. Twelve of the instructors received M. A. degrees from Michigan State University and 2 from Western Michigan University. One person earned a doctor's degree at the University of Michigan.

Apprenticeships served by instructors. Only 21 of the 138 instructors completed an apprenticeship as revealed in Table VII which lists 12 apprenticed trades. The closely related fields of tool making, tool and die making, and machining constituted nearly half of the total

TABLE VI

INSTITUTIONS AT WHICH DEGREES WERE EARNED AS INDICATED BY THE INSTRUCTORS AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Institution granting degree	Bachelor's Degree	Master's Degree	Doctor's Degree
(Institutions out of Michigan)			
1. St. Olaf College	1	0	0
2. St. Cloud State College	1	0	0
3. Indiana State College	1	0	0
4. Emmanual Mississippi College	1	0	0
5. Pennsylvania State College	1	0	0
6. Canisius College	1	0	0
7. Illinois Institute of Technology	1	0	0
8. Valley City Teachers College	1	0	0
9. Ball State Teachers College	1	0	0
10. Wisconsin State College (Platteville)	1	0	0
11. University of Minnesota	2	4	0
12. Illinois State	1	0	0
13. Eastern Illinois University	1	0	0
14. Brigham Young University	1	0	0
15. Tri-State College	1	0	0
16. University of Wisconsin	1	0	0
17. Yale University	1	0	0
18. Colorado State College	0	1	0
19. University of Colorado	0	1	0
20. Stout State College	4	2	0
21. Purdue University	3	1	0
22. Murray College	1	1	0
23. Carnegie Institute of Technology	1	1	1
24. Otterbein College	1	0	0
25. Bowling Green State University	2	0	0
26. Buffalo State College	1	0	0
27. Ohio State University	1	0	0
28. City College of New York	1	0	0
29. Wisconsin Central State College	1	0	0
30. Western Illinois University	1	0	0
31. Oklahoma State University	1	0	0
32. Fairmont State College	1	0	0
33. University of Vermont	1	0	0

TABLE VI (continued)

Institution granting degree	Bachelor's Degree	Master's Degree	Doctor's Degree
34. Iowa State Teachers College	1	1	0
35. St. Louis University	1	0	0
36. Indiana University	0	2	0
37. University of Buffalo	0	1	0
38. Northwestern University	0	1	0
39. West Virginia University	0	1	0
40. University of Missouri	0	1	0
41. University of Illinois	0	2	0
42. Iowa State University	0	1	0
43. University of Connecticut	0	1	0
Total out-of-state institutions	40	23	1
(Institutions in Michigan)			
1. Wayne State University	6	0	0
2. Western Michigan University	21	2	0
3. Albion College	1	0	0
4. University of Michigan	8	29	1
5. Michigan State University	16	12	0
6. Central Michigan University	10	0	0
7. General Motors Institute	5	0	0
8. Northern Michigan College	5	0	0
9. University of Detroit	1	0	0
10. Olivet College	1	0	0
11. Eastern Michigan University	6	0	0
12. Michigan College of Mining and Technology	1	0	0
Total in-state institutions	81	44	1
Grand total of number of degrees earned in both groups	121	67	2

TABLE VII

NUMBER AND PERCENTAGE OF INSTRUCTORS WHO HAVE DURING PREVIOUS YEARS COMPLETED THE SERVING OF AN APPRENTICESHIP

Apprenticed trade	Number who served an apprenticeship	Per cent of those who served apprenticeship in each trade
1. Airplane engine mechanic	1	4.76
2. Auto mechanics	2	9.53
3. Cable splicing	1	4.76
4. Carpentry	1	4.76
5. Foundry	1	4.76
6. Instrument making	1	4.76
7. Machinist	3	14.29
8. Sheet metal	2	9.53
9. Tile and terrazzo	1	4.76
10. Tool and die making	6	28.57
11. Tool making	1	4.76
12. Welding	1	4.76
Total	21	100.

number.

Kinds of vocational certificates. Five different categories of certificates were listed on the applications of the teachers requesting vocational certification as shown in Table VIII. These were: 1-year special, 3-year special, 5-year special, secondary provisional, and permanent. The total number of instructors granted 1-year special and 3-year special certificates constituted 55 per cent of the total certificates in force of a vocational nature in the industrial-technical field. While only 13 per cent had permanent certificates nearly 29 per cent had the secondary provisional certificate. The median was slightly above the 3-year special group.

The policy of the local administration of the community junior colleges, the policy of the State Department, and rapid growth of the vocational programs may have been factors in the employment of new teachers who had been issued 1-year special certificates.

Teachers' general education certification. In addition to vocational certification about two-thirds of the instructors had general education certification. As some of the instructors had been teaching in Michigan for many years, they indicated possession of "life" certificates; others had secondary provisional and secondary permanent certificates.

Study of Table IX shows that 38 per cent had received community college certificates and most of these instructors qualified for the permanent certificates.

TABLE VIII

THE KIND OF VOCATIONAL CERTIFICATE HELD BY THE INSTRUCTORS OF INDUSTRIAL-TECHNICAL CURRICULA WITH THE NUMBER AND PERCENTAGE OF EACH

Institution	Certificate					Total
	Special 1-year	Special 3-year	Special 5-year	Secondary provisional	Permanent	
1.	1	0	0	2	0	3
2.	4	0	0	0	1	5
3.	7	16	0	1	3	27
4.	0	0	0	5	1	6
5.	0	1	0	6	7	14
6.	12	14	1	13	2	42
7.	1	1	0	2	1	5
8.	5	2	0	2	0	9
9.	4	3	2	3	1	13
10.	1	0	0	3	0	4
11.	1	3	1	3	2	10
Total	36	40	4	40	18	138
Per cent	26.09	28.99	2.89	28.99	13.04	100

TABLE IX

THE KIND OF GENERAL EDUCATION CERTIFICATE HELD BY THE INSTRUCTORS AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Inst.	Kind of Michigan general education certificate							Total
	None or none given	Kind not given	Given as "life" only	Secondary provisional	Secondary permanent	Community college special	Community college permanent	
1.	0	0	0	0	2	0	3	5
2.	1	0	1	0	0	0	2	4
3.	6	0	7	4	3	2	6	28
4.	0	0	2	1	2	0	1	6
5.	3	0	1	0	3	0	7	14
6.	7	0	4	3	6	5	21	46
7.	1	0	0	0	3	0	4	8
8.	7	0	0	1	1	0	0	9
9.	6	1	4	2	0	2	1	16
10.	0	0	0	1	1	0	2	4
11.	3	0	1	5	0	0	1	10
Total	34	1	20	17	21	9	48	150
Per cent	22.67	.67	13.33	11.33	14.00	6.00	32.00	100

Thirty-eight per cent had secondary certification. This is exactly the same percentage that had been granted community college certification.

Some of the instructors were certified for more than one field. This accounts for the fact that 150 instead of 138 constitute the total of this group.

Types of programs instructors participated in. Table X depicts the functional assignments of the faculty. The data was organized relative to participation in all-day trade programs from the point of view of full-time or part-time service. It was found that in 2 cases instructors served in dual capacities of teacher and coordinator.

The information in the files indicated that only 1 institution specifically listed instructors as being in apprentice programs; whereas, 2 colleges listed instructors separately in evening trade extension programs. While the other colleges have listed only all-day trade programs on the report, this does not necessarily indicate that all of the courses are taught during the day.

Forty-seven per cent of the instructors were listed as full-time all-day trade instructors and over 30 per cent as less-than-full-time all-day trade instructors. One college employed 2 individuals in the single capacity of coordinators.

Instructors' number of years of teaching experience. Table XI shows the number of years of teaching experience indicated by the instructors of industrial-technical curricula. The data has been

TABLE X

TYPE OF INSTRUCTIONAL ACTIVITY INDICATED OF THE INSTRUCTORS AND COORDINATORS OF INDUSTRIAL-TECHNICAL CURRICULA DURING THE SCHOOL YEAR 1960-61

Inst.	All-day trade programs				Evening trade extension	Apprentice programs	Total
	Full time to N.D.E.A. classes	Less than full time to N.D.E.A. classes	Both teach and coord.	Coord. only	Instructors	Instructors	
1.	0	3	0	0	0	0	3
2.	1	4	0	0	0	0	5
3.	4	10	0	0	13	0	27
4.	5	1	0	0	0	0	6
5.	6	6	2	0	0	0	14
6.	32	4	4	2	0	0	42
7.	2	3	0	0	0	0	5
8.	1	3	0	0	5	0	9
9.	11	2	0	0	0	0	13
10.	2	2	0	0	0	0	4
11.	1	4	0	0	0	5	10
Total	65	42	6	2	18	5	138
Per cent	47.11	30.44	4.34	1.44	13.05	3.62	100

NOTE: The individuals are counted only once and listed with the area of major activity.

TABLE XI

THE NUMBER OF YEARS OF TEACHING EXPERIENCE INDICATED BY THE INSTRUCTORS OF INDUSTRIAL-TECHNICAL CURRICULA AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Inst.	Years of teaching experience												Total
	None or none given	1-3 (Inc.)	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	Over 30	
1.	0	0	1	1	0	0	0	0	0	0	1	0	3
2.	1	0	0	1	1	1	0	0	0	0	1	0	5
3.	3	4	4	1	2	2	2	1	2	1	1	4	27
4.	0	1	0	2	0	0	0	2	0	1	0	0	6
5.	0	3	1	2	2	1	0	1	3	0	0	1	14
6.	3	7	7	7	4	1	3	3	1	2	1	3	42
7.	1	1	1	0	1	0	0	0	0	0	1	0	5
8.	6	0	1	0	0	1	0	0	1	0	0	0	9
9.	4	3	2	1	0	0	0	1	1	0	0	1	13
10.	0	2	0	1	0	0	0	1	0	0	0	0	4
11.	0	2	5	0	0	0	2	0	1	0	0	0	10
Total	18	23	22	16	10	6	7	9	9	4	5	9	138
Per cent	13.05	16.67	15.95	11.60	7.25	4.34	5.07	6.52	6.52	2.89	3.62	6.52	100

summarized into time periods of intervals of three years by colleges.

Nine teachers, 6.52 per cent of the total of 138, had been teaching for over 30 years. Approximately 45 per cent of the instructors had over 10 years of teaching experience. In fact, the median is in the 7-9 year group.

One out of every 4 indicated 3 years or less of teaching experience and over 13 per cent indicated no experience in teaching at the time of the certificate application.

Instructors' other work experience. Table XII shows the amount of total work experience and the amount of closely related work experience is in Table XIII.

All work experience, related and unrelated, is listed for the instructors in Table XII. The median work experience is in the group 73-84 months at approximately 76 months.

The importance of work experience depends upon how closely the work experience relates to the subjects being taught. Thus an analysis was made (1) of the work experiences listed by each applicant and, (2) the subjects the individual was certified to teach, then (3) the number of months of work experience in fields closely related to the certified subjects was determined.

The median of closely related work experience is in the group 49-60 months at approximately the 50-month level.

Since the State Department of Education requires work experience, further investigation may be necessary as Form 151 does not indicate the

TABLE XII

NUMBER OF MONTHS OF WORK EXPERIENCE OTHER THAN TEACHING AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Inst.	Months of other work experience											Total
	None or none given	1-12 (Inc.)	13-24	25-36	37-48	49-60	61-72	73-84	85-96	97-108	Over 109	
1.	0	0	0	1	0	0	0	1	0	0	1	3
2.	1	0	1	2	0	0	0	1	0	0	0	5
3.	1	3	2	2	7	0	0	5	1	1	5	27
4.	0	0	0	0	0	0	0	1	0	1	4	6
5.	0	0	0	2	0	4	2	0	1	1	4	14
6.	0	1	4	1	5	5	3	1	4	2	16	42
7.	0	0	0	0	1	0	1	0	0	0	3	5
8.	0	0	1	1	1	0	1	0	0	0	5	9
9.	0	0	1	1	2	1	2	2	0	1	3	13
10.	0	0	0	1	0	0	0	1	1	1	0	4
11.	0	0	0	0	2	1	1	1	1	1	3	10
Total	2	4	9	11	18	11	10	13	8	8	44	138
Per cent	1.44	2.89	6.52	7.98	13.05	7.98	7.24	9.43	5.79	5.79	31.89	100

TABLE XIII

NUMBER OF MONTHS OF CLOSELY RELATED WORK EXPERIENCE OTHER THAN TEACHING AT THE TIME OF THE MOST RECENT RENEWAL OF THE VOCATIONAL CERTIFICATE

Inst.	Months of other work experience											Total
	None or none given	1-12 (Inc.)	13-24	25-36	37-48	49-60	61-72	73-84	85-96	97-108	Over 109	
1.	0	2	0	1	0	0	0	0	0	0	0	3
2.	2	1	1	0	1	0	0	0	0	0	0	5
3.	6	5	1	1	4	0	2	3	1	0	4	27
4.	0	0	1	0	0	0	0	1	1	1	2	6
5.	0	0	0	2	4	1	1	0	2	2	2	14
6.	3	8	4	0	3	7	3	1	4	2	7	42
7.	0	1	0	1	0	0	0	2	0	0	1	5
8.	1	0	1	1	0	0	2	0	1	1	2	9
9.	0	0	2	2	1	1	2	1	1	0	3	13
10.	1	1	0	0	1	0	0	0	1	0	0	4
11.	2	0	0	0	3	1	1	0	1	0	2	10
Total	15	18	10	8	17	10	11	8	12	6	23	138
Per cent	10.88	13.05	7.25	5.79	12.32	7.25	7.98	5.79	8.70	4.34	16.67	100

work experience of 10 per cent of the applicants. The next group making up about 13 per cent of the total, listed between 1 and 12 months of closely related work experience. Twenty-three of the instructors, 16.66 per cent of the total, had more than 109 months of closely related work experience.

Sex of instructors. Review of the findings indicates that only one woman was employed for this type of teaching. This woman shared the duties as a member of the faculty of Institution 7.

Length of all-day trade courses. In Table XIV the reports of the participating community junior colleges suggested considerable variation in the length of the courses offered under Title VIII of the NDEA in Michigan.

Length of evening extension and apprentice courses. Table XV lists the hourly length of the different classes offered as evening extension classes and also those designated as apprentice classes.

Only Institution 11 listed apprentice classes on the annual report, while Institutions 3 and 8 listed specific evening extension classes. The number of hours selected for the table coincide with those given on the annual report of the college.

Industrial-technical curricula and enrollments. Growth in number of programs and enrollment within the programs is seen in Table XVI. While the 1958-59 report listed 8 institutions having 18 different programs, the 1960-61 report had 11 institutions offering 49 different

TABLE XIV

LENGTH IN WEEKS OF ALL-DAY TRADE COURSES TAUGHT IN THE PUBLIC COMMUNITY JUNIOR COLLEGES UNDER TITLE VIII DURING THE SCHOOL YEAR 1960-61

Inst.	Varying length of courses in weeks														Total
	11	12	18	19	19.5	20	32	36	38	39	40	44	48	52	
1.			*					*							2
2.							*								1
3.									*						1
4.									*			*	*		3
5.			*												1
6.		*			*										2
7.				*					*						2
8.						*		*							2
9.	*	*													2
10.						*					*			*	3
11.										*					1
Total	1	2	2	1	1	2	1	2	3	1	1	1	1	1	20
Per cent	5	10	10	5	5	10	5	10	15	5	5	5	5	5	100

programs.

The enrollments are shown by both preparatory and extension curricula, as well as by the sex of the students enrolled.

A wide variety of preparatory and extension curricula was offered by some of the institutions. Institution 3 offered 23 different curricula, while Institution 1 offered only 1 curriculum.

Some of the more common curricula listed were in the field of electronic and electrical technology, industrial technology, and mechanical technology.

TABLE XV

NUMBER OF CLASSES AND THE LENGTH OF EVENING EXTENSION AND APPRENTICE PROGRAMS IN HOURS UNDER TITLE VIII DURING THE SCHOOL YEAR 1960-61

Inst.	Number of classes of hours duration													Total
	30	36	54	68	102	104	108	120	136	168	180	204	272	
3.	0	0	0	1	9	1	0	0	5	4	0	5	1	26
8.	0	1	6	0	0	0	1	0	0	0	0	0	0	8
11.	1*	0	0	0	0	0	0	1*	0	0	3*	0	0	5
Total	1*	1	6	1	9	1	1	1*	5	4	3*	5	1	39
Per cent	2.56	2.56	15.39	2.56	23.08	2.56	2.56	2.56	12.34	10.25	7.69	12.83	2.56	100

TABLE XVI

SCHOOLS, CURRICULUM AND COURSE TITLES, AND ENROLLMENTS IN INDUSTRIAL-TECHNICAL CURRICULA IN N.D.E.A. TITLE VIII PROGRAMS IN PUBLIC COMMUNITY JUNIOR COLLEGES IN MICHIGAN DURING THE YEARS 1958-59, 1959-60, AND 1960-61

Inst.	Preparatory curriculum titles	Extension course titles	1958-59 Enrollments							1959-60 Enrollments							1960-61 Enrollments						
			Total both	M	F	Prep M	Prep F	Ext M	Ext F	Total both	M	F	Prep M	Prep F	Ext M	Ext F	Total both	M	F	Prep M	Prep F	Ext M	Ext F
1.	Drafting																40	40		40			
	Electronics technology																29	29		29			
	Engineering technology																39	39		39			
2.	Mechanical technology									83	83		83										
	Drafting																60	60		60			
3.	Chemical technology		73	44	29	44	29			179	125	54	125	54			233	233		233			
	Chemical processes																335		335		335		
	Drafting																234	234		234			
	Electronic technology																31	31		31			
	Engineering technology		271	262	9	262	9																
	Engineering mathematics																654		654		654		
	Industrial technology									163	97	66	97	66			35	35		35			
	Ind. tech. engineering									174	157	17	157	17									

TABLE XVI (Continued)

TABLE XVI (continued)

Inst.	Preparatory curriculum titles	Extension course titles	1958-59 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1959-60 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1960-61 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F
3.	Machine design																10	10		10			
	Mechanical technology									38	38		38										
	Metallurgy (metals)																152	152		152			
	Metal processing																15	15		15			
	Physics																32	32		32			
	Welding																58	58		58			
		Chemistry								19	16	3			16	3							
		Electronics								18	18				18								
		Industrial technology	351	294	57			294	57														
		Machinists								16	16				16		19	19				19*	
		Mathematics								31	31				31								
		Apprentice machinists								22	22				22*								
		Tool and die apprentices								55	55				55*		50	50				50*	
		Physics								25	25				25								
		Shop tech.								61	61				61								
4.	Design technology		23	23		23				44	44		44										
	Electronic technology		17	17		17				26	26		26				19	19		19			
	Instrument control																39	39		39			

* Apprentices

TABLE XVI (continued)

Inst.	Preparatory curriculum titles	Extension course titles	1958-59 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1959-60 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1960-61 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F
4.	Mechanical technology		23	23		23				36	36		36				31	31		31			
5.	Automotive technology		82	82		82				100	100		100				42	42		42			
	Drafting technology		117	117		117				191	191		191				69	69		69			
	Electrical-electronics		93	93		93				78	78		78				36	36		36			
	Metallurgical technology		56	56		56				91	91		91				31	31		31			
6.	Electrical technology		118	118		118				137	137		137				124	124		124			
	Mechanical technology		94	94		94				135	135		135				148	148		148			
		Die maker								125	125				125*		269	269				269*	
		Electrical								37	37				37*		66	66				66*	
		Machinist								124	124				124*		182	182				182*	
		Maintenance mechanics								14	14				14*								
		Patternmakers								8	8				8*		20	20				20*	
		Pipefitter-plumber								26	26				26*		53	53				53*	
		Sheet metal								26	26				26*		45	45				45*	
		Welding								6	6				6*		26	26				26*	
		Assembly prod. engr.								9	9				9*								

*Apprentices

TABLE XVI (continued)

TABLE XVI (continued)

Inst.	Preparatory curriculum titles	Extension course titles	1958-59 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1959-60 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1960-61 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F
7.	Machinist		46	46		46																	
	Mechanical technology									41	41		41				82	82		82			
8.	Industrial technology		31	31		31				50	50		50				88	88		88			
	Electrical technology									42	42		42				71	71		71			
9.	Civil technology		49	49		49				84	84		84				79	79		79			
	Electrical technology		37	37		37				64	64		64				60	60		60			
	Mechanical technology		46	46		46				97	97		97				94	94		94			
		Blacksmithing								1	1				1								
		Drafting								22	22				22								
		Electricity								10	10				10								
		Machine shop								52	52				52								
		Mechanic service								3	3				3								
		Steamfitting								7	7				7								
		Sheet metal								5	5				5								
		Welding								3	3				3								
		Highway inspector								26	26				26								
10.	Industrial technology		54	54		54				49	49				49		50	50		50			

TABLE XVI (continued)

Inst.	Preparatory curriculum titles	Extension course titles	1958-59 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1959-60 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F	1960-61 Enrollments Total both	M	F	Prep M	Prep F	Ext M	Ext F
11.	Automotive technology									22	22		22				26	26		26			
	Drafting technology									108	108		108				51	51		51			
	Electronic technology																24	24		24			
	Industrial technology																56	56		56			
	Mechanical technology									40	40		40										
	Electrical																10	10		10*			
	Electronics									27	27		27										
	Patternmaker																18	18		18*			
	Quality control									21	21		21										
	Sheet metal																17	17		17*			
	Tool and die maker																14	14		14*			

NOTE: 1. (*) Indicates apprentice.

2. The abbreviations used: Prep for preparatory; Ext for extension; M for male; and F for female.

The extension courses utilized for related training for the apprentices were listed under extension course titles which were similar to those of the names of the trades. The number of apprentices was marked with the asterisk.

Only Institution 3 reported female students in these curricula. This institution reported 335 female students in Chemical Processes curriculum and 654 in the Engineering Mathematics curriculum.

In Table XVI the following abbreviations have been employed: Prep for preparatory; Ext for extension; M for male and F for female.

Summary of enrollments by years. The total enrollment by institutions is shown in Table XVII for each of the community junior colleges for the school years 1958-59, 1959-60, and 1960-61.

The organization of the table and the abbreviations used are the same as for Table XVI. As the number of students enrolled in each of the curricula was provided in Table XVI, Table XVII provides a recapitulation of the total data on enrollment by institutions.

While the final total enrollment of all institutions increased from 2871 (1959-60) to 4042 (1960-61) some of the institutions had smaller enrollments during 1960-61 than during 1959-60. The total enrollment approximately doubled from 1958-59 to 1959-60.

During the three year period only 1 institution had a stabilized level of enrollment. The greatest relative growth was in Institution 3, 6, 7, and 8. Institution 5 experienced a definite drop in enrollment from 1959-60 to 1960-61.

TABLE XVII

A SUMMARY OF THE TOTAL ENROLLMENTS BY SCHOOLS IN N.D.E.A. TITLE VIII PROGRAMS IN PUBLIC COMMUNITY JUNIOR COLLEGES IN MICHIGAN DURING THE YEARS 1958-59, 1959-60, AND 1960-61

Inst.	1958-59 Enrollment							1959-60 Enrollments							1960-61 Enrollments						
	Total both	M	F	Prep M	Prep F	Ext M	Ext F	Total both	M	F	Prep M	Prep F	Ext M	Ext F	Total both	M	F	Prep M	Prep F	Ext M	Ext F
1.															108	108		108			
2.								83	83		83										
3.	695	600	95	306	38	294	57	801	661	140	417	137	244	3	1858	869	989	800	989	69	0
4.	63	63		63				106	106		106				89	89		89			
5.	348	348		348				460	460		460				178	178		178			
6.	212	212		212				647	647		272		375		933	933		272		661	
7.	46	46		46				41	41		41				82	82		82			
8.	31	31		31				92	92		92				159	159		159			
9.	132	132		132				374	374		245		129		233	233		233			
10.	54	54		54				49	49		49				50	50		50			
11.								218	218		170		48		216	216		157		59	
Total	1581	1486	95	1192	38	294	57	2871	2731	140	1935	137	796	3	4042	3053	989	2264	989	789	0

NOTE: The abbreviations used: Prep for preparatory; Ext for extension; M for male; and F for female.

During 1958-59 approximately 1 student in 15 was a female; whereas, in 1960-61 about 1 in 4 was female. This may not reflect a continuous trend, however, since all of these females attended 1 institution which as now has been dissolved and replaced by a new community college.

In 1958-59 1 student in 5 was an extension student and approximately the same ratio existed during 1960-61. In 1959-60 the ratio of extension students to total students was approximately 2 to 7.

Summary.

1. During the school year 1960-61 all of the instructors with one exception were men.
2. While 11 of the colleges employed instructors having vocational certificates issued by the State of Michigan, 75 per cent of them were employed by 5 colleges.
3. The median education of the instructors was in the master's degree group with the largest single group having the master's degree in education and the bachelor's degree in industrial arts, although many had other degrees in both groups. Two of every 3 instructors earned the bachelor's and master's degrees in Michigan.
4. The median of courses in teacher education was approximately 6 semester hours while the median of semester hours in technical courses was 18.
5. Every seventh instructor had served an "apprenticeship."
6. The median vocational certification was in the 3-year special

group.

7. Over 75 per cent had some kind of general education certificate and nearly 40 per cent had a community college certificate.
8. Nearly one-half of the instructors were employed as full-time instructors in all-day trade programs.
9. While the median number of years of teaching experience was 8 years, the median number of closely related work experience was 50 months.

CHAPTER IV

CHARACTERISTICS OF THE CURRICULA

The principle objective of this part was to analyze the curricula of industrial-technical programs of the Michigan public community junior colleges. The purpose was to gain a broad perspective of the courses offered by each of the institutions in each curricula.

The most recent catalogs and course descriptions as well as other bulletins supplied by the community junior colleges were utilized for this purpose.

In making the analysis, institutions that offered curricula having the same title have been grouped together for ease of comparison. To have another common base of comparison the credit hours of the schools that operated on the quarter-hour system have been converted to semester hours.

An effort has been made to utilize a common format with common headings for groups of related courses. Headings that do not apply to particular curricula have been omitted from those analyses. The common headings for groups of courses as "Business", "Social Science", etc. have been employed. The heading "Technology" has been used for those specific courses of a technical nature oriented to the particular needs of the curriculum of the technology being analyzed.

In each table provision was made for explanatory comments deemed helpful in understanding the nature of the particular course.

A study of the catalogs revealed that 13 institutions listed in their catalogs 38 programs in the field of industrial-technical curricula. This information has been summarized in Table XVIII.

While 13 different curricula were listed as being offered by all of the institutions, 4 of these 13 were available in only 1 institution.

Automotive technology. A study of the various courses required by each of the colleges revealed a few similarities and many differences. (See Table XIX.) Both colleges listed courses in technical mathematics, physical education, and freshman English composition.

Further analysis clearly indicates that some fundamental differences of objectives existed and implementation to achieve the objectives has resulted in development of courses to meet these needs. Institution 5 placed heavy emphasis on courses in the field of specific technical aspects of the automotive field as front end and wheel alignment, transmissions, internal combustion engines, automotive electricity, carburetion, ignition, etc. Institution 11 required courses in basic electricity, speech and technical report writing, foremanship training, applied psychology, and automotive service management. While Institution 11 required some of the same courses in specific technical aspects of the automotive field it seemed that the organization and emphasis was somewhat different than that of Institution 5. Both colleges also required a course in machine shop.

The objectives of Institution 5 in automotive technology were to provide a thorough knowledge of the technical aspects of the automobile

TABLE XVIII

AN ANALYSIS OF THE COURSE OFFERINGS OF THE PUBLIC COMMUNITY JUNIOR COLLEGES OF MICHIGAN IN THE INDUSTRIAL-TECHNICAL CURRICULA AS GIVEN IN THE MOST RECENTLY PUBLISHED CATALOGS

Curricula	College 1	2	3	4	5	6	7	8	9	10	11	12	13	Number having program
Architecture (Architectural drafting)			X											1
Automotive technology					X						X			2
Body drafting technician													X	1
Chemical technology	X		X				X				X			4
Civil technology									X			X		2
Drafting technology	X	X		X	X		X				X		X	7
Electrical technology				X		X		X						3
Electronics technology	X				X		X		X		X			5
Engineering technology	X		X											2
Industrial management technology		X												1
Industrial technology	X							X		X	X			4
Mechanical technology		X		X		X	X		X					5
Metallurgical technology					X									1
Total programs by institutions	5	3	3	3	4	2	4	2	3	1	5	1	2	38

NOTE: Year of catalogs:

College 3 -- 1959-61
Colleges 1 and 9 -- 1960-61
Colleges 2, 6, 7, 8, 10, 11 and 12 -- 1961-62
Colleges 4, 5, and 13 -- 1961-63

TABLE XIX

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN AUTOMOTIVE TECHNOLOGY GIVEN BY THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Courses	Semester hours in Institutions 5	11
DRAFTING AND DESIGN		
Basic Drafting (Mechanical	5	
ELECTIVES	3	
ELECTRICITY AND ELECTRONICS		
Basic Electricity		3
ENGLISH		
Freshman English Composition	6	3
Speech		2
Technical Report Writing		3
LEADERSHIP TRAINING		
Foremanship Training		3
MATHEMATICS		
Technical Mathematics (Applied basic) .	6-8	6
PHYSICAL EDUCATION	2	2
PHYSICAL SCIENCE		
Chemistry (Practical)	4	
Physics (Practical)	4	
PSYCHOLOGY		
Applied Psychology		3
SOCIAL SCIENCE		
Man and Society	6	
Socio-Economic Problems		3
TECHNOLOGY		
Automotive Service Management		3
Automotive (Basic)		7
Engine Rebuilding		7
Front End and Wheel Alignment	2	7
Transmissions	3	7
Internal Combustion Engines	3	
Automotive Electricity	3	
Carburetion, Fuel Systems	2	
Ignition Systems	2	
Engine Testing	3	
Hydraulics	2	
Industrial Materials	3	
Machine Shop	3	3
Welding		3
Total semester hours	62-64	65

and to develop manual skills in servicing, testing and diagnosing.

Architecture. One institution offered a curricula in architecture as a two-year program. An analysis of this program was useful for understanding industrial-technical education in the community junior college. (See Table XX.)

TABLE XX

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN ARCHITECTURE GIVEN BY THE ONLY MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGE OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institution 3
ARCHITECTURE	
Architectural Details	3
Small Home Planning	3
Architecture (Scale models)	3
Architecture (Design of commercial units)	3
ART	
Freehand Drawing	3
Drawing and Composition	3
History of Western Art	6
Introduction to Design	2
BUSINESS	
Beginning Typewriting	2
DRAFTING AND DESIGN	
Lettering	2
ELECTIVES	2
ENGLISH	
Business Communications	6
Speech	3
MATHEMATICS	
Technical Mathematics (Applied basic)..	11
Mathematics elective	4
PHYSICAL EDUCATION	2
SOCIAL SCIENCE	
Economics	3
Political Science	3
Total semester hours	64

In addition to courses in freehand drawing and drafting, this program required 12 semester hours of credit in architecture relating to architectural details, small home planning and related subjects. Courses were also listed in art, history, and the basic elements of design.

Institution 3 as part of this curricula also required a course in beginning typewriting.

Eleven semester hour credits in technical mathematics ranging from applied arithmetic to logarithms and including strength of materials was required for this program.

The college that offered this curriculum emphasized that it was intended to provide basic training for architectural draftsmen and designed to prepare them for specific employment after a two-year period of community junior college education.

Body drafting technology. A program of study not usually found in the community junior colleges was the curriculum in body drafting technology. At the present only one of these colleges in Michigan offered such a program. Table XXI gives the courses of this sequence.

Institution 13 required as a pre-requisite to enrollment in the body drafting technician program completion of a sequence of 30 semester credit hours in the terminal drafting technician program. In effect, the courses of this sequence represented more advanced work for qualified students.

Several of the courses were similar to those required in other drafting curricula. Examples were descriptive geometry, trigonometry, and political science.

This program contained some courses that are unique to body drafting technology. Some of these courses were related to surface development, body detailing, and panel tipping, to mention a few.

Chemical technology. The catalogs of four community junior colleges listed curricula in chemical technology. (See Table XXII.)

The literature of Institution 1 stated that the graduate of the program would be qualified to perform routine analysis encountered in

TABLE XXI

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN BODY DRAFTING TECHNOLOGY GIVEN BY THE ONLY MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGE WHICH OFFERED THIS PROGRAM DURING 1960-61

Course	Semester hours in Institution 13
DRAFTING AND DESIGN	
Descriptive Geometry	2
Body Detailing	11
Design Problems	5
Surface Development	5
MATHEMATICS	
Trigonometry	1
SOCIAL SCIENCE	
Political Science	4
TECHNOLOGY	
Blueprint Reading	4
Character of Metal	1
Panel Tipping	2
Total semester hours	35

TABLE XXII

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN CHEMICAL TECHNOLOGY GIVEN BY EACH OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Courses	Semester hours in Institutions			
	1	3	7	11
BUSINESS				
Typing	2		2	
Industrial Relations			3	
ELECTIVES	18	14-16	4-6	9
Chem. & Met. Engineering			3	
DRAFTING AND DESIGN				
Technical Drawing			3	3
Machine Drawing and Design				3
ENGLISH				
Freshman English Composition	6	6		6
Technical English			6	
Speech	3			
Technical Report Writing				3
MATHEMATICS				
Intermediate Algebra	2-4	3		
Intermediate Algebra & Trigonometry ..			4	
College Algebra & Trigonometry				5
Plane Trigonometry (or Analytic Geometry)	3-4			
Plane Geometry		5		4
Analytic Geometry & Calculus			4	
Calculus				8
Slide Rule		1		
PHYSICAL EDUCATION	4S	2	2S	2
PHYSICAL SCIENCE				
Botany (or Zoology)			4	
Chemistry (Gen. & Inorganic)	8	8-9	8-9	8
Chemistry (Organic)			6	
Chemistry (Qualitative Analysis) . . .	8	8-10	4	
Physics (General)		8	8	
Metallurgy				3
PSYCHOLOGY				
Basic Psychology	3			
SOCIAL SCIENCE				
History of Western Civilization	6			
Political Science	3	3-4	3	
Socio-Economic Problems				3
TECHNOLOGY				
Metal Processing				3
Machine Shop				6
Total semester hours	62-65	61-67	62-65	63

quality control, and to act as an engineering aide. Institution 3 indicated that this curricula was definitely intended for preparing graduates for employment after two years of college. Institution 7 related its objectives specifically to the preparation of graduates of this program for positions as chemical technicians in control laboratories, in water purification and sewage disposal plants, and in petroleum industries. Institution 11's catalog does not give its program objectives.

While all of these institutions permitted some electives in the curriculum, Institutions 1 and 3 permitted approximately one-fourth of the credits to be electives.

Since chemical technology was a rather specialized curricula it was difficult to understand the wide differences between the programs of these institutions.

Common courses were English, algebra, trigonometry, general and inorganic chemistry, and political science.

Perhaps Institution 11 required courses in machine drawing and design, metal processing, and machine shop for this curricula because it perceived a close relationship between chemistry and metallurgy.

Some institutions departed from the traditional courses in freshman English and introduced courses in technical report writing, technical English, and speech.

Two of the institutions followed the practice of simply indicating the number of required semesters of physical education rather than setting the number of semester hours. This fact is indicated in Table

XXII by the symbol 2S for 2 semesters and 4S for 4 semesters.

Civil technology. Civil technology was available curricula in two of the community junior colleges in Michigan. The course requirements are listed in Table XXIII. (Note that conversion to semester hours has resulted in fractions for some of the courses listed.)

The two colleges agreed about requirements in drafting, English, mathematics, the physical sciences, and political science.

The main difference lay in the heavy emphasis Institution 9 had placed on technology in the form of courses in construction methods, materials, costs, and also, the added emphasis on additional courses in surveying, soil testing, and structural technology. Institution 12 on the other hand, placed emphasis on humanities, general and inorganic chemistry, and engineering orientation in greater degree than Institution 9.

Institution 9 required 72-75 semester hours for completion of the curricula instead of the 64 semester hours required by Institution 12. Many of the institutions listed 62-65 as the number of semester hours required for completion of the curricula in any industrial-technical field.

Drafting technology. Seven junior colleges offered curricula in drafting technology. Table XXIV provides information about the required courses of this curricula.

Institution 13 did not provide a detailed break-down of the drafting and design sequence. The catalog of this institution listed

TABLE XXIII

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN CIVIL TECHNOLOGY GIVEN BY EACH OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions 9	12
BUSINESS		
Business Law	1 1/3	
DRAFTING AND DESIGN		
Technical Drawing	4	4
Descriptive Geometry	2	2
Structural Drafting	3	2
ELECTIVES	2 2/3 - 3 1/3	6 2/3
ENGINEERING		
Engineering Orientation		2/3
ENGLISH		
Freshman English Composition	6	6
Technical Report Writing	1 1/3	
Public Speaking		2
HUMANITIES		
MATHEMATICS		
College Algebra	3 1/3	2 2/3
Slide Rule		2/3
Trigonometry	3 1/3	2
PHYSICAL EDUCATION	1 1/3	2
PHYSICAL SCIENCE		
Physics (Mechanics & Heat)	2 2/3	2 2/3
Physics (Electricity & Magnetism) . . .	2 2/3	2 2/3
Physics (Optics)	2 2/3	2 2/3
Chemistry (General & Inorganic)		8
SOCIAL SCIENCE		
Economics	2 2/3	
Political Science (Am. Government) . ..	2 2/3	3 1/3
Sociology	2 2/3	
TECHNOLOGY		
Construction Methods	1 1/3	
Construction Materials	2 2/3	
Construction Costs	1 1/3	
Elementary Surveying	3 1/3	2 2/3
Route Surveying	2 2/3	
Hydrology	2	
Soil Testing	2	
Advanced Surveying	2 2/3	
Highway Technology	2 2/3	
Strength of Materials	2	
Geodetic Surveying Surveying	2 2/3	
Structural Technology	2 2/3	
Project Laboratory	1 1/3 - 4	
Construction Estimating		1 1/3
Total semester hours	72 - 75 1/3	64

TABLE XXIV

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN DRAFTING TECHNOLOGY GIVEN BY EACH OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions						
	1	4	7	5	2	11	13
BUSINESS							
Industrial Management		3	4				
Industrial Relations			3				
ELECTIVES	18			2-3		3	
ELECTRICITY - ELECTRONICS							
Technical Electricity		2			3		1
Technical Electronics		2			3		
ENGINEERING							
Engineering Lectures (Orientation)		1					
Engineering Problems		2					
Practical Mechanics & Strength of Materials		3					2
Mechanisms		3					
DRAFTING AND DESIGN							12
Basic Mechanical Drafting	2	8	3	3	3	3	
Pictoral & Mechanical Drafting	2						
Pattern Development	3						
Architectural Drafting	3						
Advanced Drawing		6		2			
Small Tools, Dies, Jigs-Fixtures ..		4	3	3			
Machine Design		4			3	3	
Complete Working Drawings		4					
Descriptive Geometry			4				
Orthographic and Pictorial			2				
Art Drawing			2				
Art Drawing (Sketching)			2				
Advanced Aux. Projection				3			
Die Design				2			
Mechanisms and Linkages				3			
Product Drawing				2	4	6	
Tool and Die Design					4		
Geometry of Drafting						6	
ENGLISH							
Freshman English Composition	6			6	3	3	1
Speech	3					2	
Composition & Technical English . .		3					
Technical Report Writing		3				3	1
Technical English			6		3		
LEADERSHIP TRAINING							
Foremanship Training						3	

TABLE XXIV
(continued)

Course	Semester hours in Institutions 1	4	7	5	2	11	13
MATHEMATICS							
Int. Algebra & Solid Geom. or College Algebra	4						
Plane Trigonometry or Anal. Geometry	3-4						
Slide Rule	1						1
Technical Mathematics		3	8	6-8	8	6	
Plane Trigonometry		3					1
Technical Algebra		3					
Basic Mathematics						6	
Geometry							1
Preparatory Algebra							1
Engineering Algebra							2
PHYSICAL EDUCATION	4S	2S	2S	2		2	
PHYSICAL SCIENCE							
Chemistry (Technical)		3		4			
Physics (Technical)		3	4	4	8		
Physics (Basic)						2	
Industrial Science (Ind. Materials)			4	3	6		
Metallurgy		3				3	
PSYCHOLOGY							
Industrial Psychology		3			3		
Applied Psychology						3	
SOCIAL SCIENCE							
Political Science	3	3	3		3		
U. S. History	3						
Economics			3				
Man and Society				6			
Social-Economic Problems						3	
Social Studies Elective						3	
TECHNOLOGY							
Automation					2		
Manufacturing Processes (Machine).		2					
Manufacturing Processes (Foundry).		2	4				
Hydraulics			2				
Materials Testing		3					
Auto				2			
Heat Treating (Metal properties) .				3			
Machine Shop	9		3	6	6	6	2
Total semester hours	60-61	81	64	62-65	62	67	29

courses for 29 semester hours and indicated that the remainder, 34 semester hours, was devoted to the associate degree major.

According to the introductions in their catalogs all were in close agreement as to the nature of the position graduates could expect to secure upon completion of the sequence. Institutions 1, 2, 5, and 7 stated that graduates would be qualified to serve as junior draftsmen, detailers, or aides to engineers. Institution 5 pointed out the value of the curriculum for those interested in a position selling machine tools, serving as purchasing agents, working as technical writers or serving as plant inspectors.

A study of Table XXIV shows that only two colleges, Institution 4 and Institution 7 required a course in industrial management while only Institution 3 required a course in industrial relations. Institution 4 was the only college listing courses in orientation and engineering problems for engineers.

While all of the colleges required basic mechanical drafting courses, great differences exist as to the more advanced drafting courses required.

All colleges required basic mathematics but some indicated the courses as technical mathematics or technical algebra and one college listed a course as engineering algebra.

Fairly close agreement existed among the colleges in the fields of technical physics and technical chemistry.

Generally 60 to 65 semester hours were required except for Institution 4 (81 hours) and Institution 13 which listed only a partial curriculum.

Electrical technology. Although listed as electrical technology in the catalogs (See Table XXV.), further investigation indicated that several courses in electronics were required.

Institution 6's catalog denoted the important areas in the field of electrical technology as being electrical power, industrial electronics, communications electronics, and instrumentation.

Institution 8 had written that graduates would be prepared for employment at the technician level in the design, manufacture, installation, and maintenance of electrical power and electronics equipment.

The table clearly indicates that Institutions 4 and 6 recognized the importance of "depth" in major subject matter areas, since both

TABLE XXV

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN ELECTRICAL TECHNOLOGY GIVEN BY EACH OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions 4	6	8
BUSINESS			
Industrial Management	3		
Communications & Human Relations.		3	
ELECTRICITY AND ELECTRONICS			
Fundamentals of Electricity . . .	4	5	9
Fundamentals of Electronics . . .	4	3	
Instrumentation	6	2	2
Communication Electronics	4		2
Industrial Electronics	4	3	3
Radio Telephone	3		
Electronic Fabrication	6		

TABLE XXV
(continued)

Course	Semester hours in Institutions 4	6	8
Electric Machines		3	3
Electric Controls		5	
Radio and Television		6	
Microwaves		2	
New Developments			2
ELECTIVES		2	
ENGINEERING			
Engineering Lectures	1		
Engineering Problems	2		
Practical Mechanics and Strength of Materials	3		
DRAFTING AND DESIGN			
Technical Drawing	4	3	12
ENGLISH			
Composition and Rhetoric(Technical)	3		
Freshman English Composition . . .		6	3
Speech			1
Technical Writing	3		2-3
MATHEMATICS			
Plane Trigonometry	3		
Technical Algebra	3		
Technical Mathematics	3	9	6
PHYSICAL EDUCATION	2S	2	2
Metallurgy	3		
Technical Chemistry	3		
Technical Physics	3		
PSYCHOLOGY			
Industrial Psychology	3		
SOCIAL SCIENCE			
Economics			2
Political Science	3	4	3
TECHNOLOGY			
Manufacturing Processes (Machine).	2		
Manufacturing Processes (Casting).	2		
Materials Testing	3		
Industrial Materials		2	
Industrial Procedures			3
Welding		2	
Total semester hours	81	62	65-66

required approximately 30 semester hours in the field of electronics and electricity.

Since Institution 1 required 81 semester hours for completion of the program, more courses could be included in the program. This college required courses in engineering, physical science, and industrial psychology which the other colleges did not include.

All of the colleges required from 4 to 7 semester hours of course work in manufacturing processes.

Electronics technology. The offerings of 5 of the community junior colleges in electronics technology are given in Table XXVI.

TABLE XXVI

AN ANALYSIS OF THE INDUSTRIAL-TECHNICAL CURRICULA IN ELECTRONICS TECHNOLOGY GIVEN BY EACH OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions				
	1	7	5	9	11
BUSINESS					
Industrial Relations		3			
ELECTRICITY AND ELECTRONICS					
Electricity (Basic)	8	4	3	2 2/3	3
Electronics (Basic)	8	4	2	4 2/3	6
Industrial Electricity		3			
Electronics (Communications) . . .		3	11	9 1/3	6
Electronics (Industrial)		4	2	5 1/3	6
Electricity (D-C Machines)			3		
Electricity (A-C Machines)			3		
Computer Circuitry				2 2/3	
Printed Circuits				1 1/3	
Testing Methods				1 1/3	
Electronic Project Laboratory . ..				1 1/3	
Transistory Theory				2 2/3	
ELECTIVES	10	8	3		
DRAFTING AND DESIGN					
Technical Drafting(Mechanical) . .	2	3	3	4	6
Electrical and Electronics Drawing				2	

TABLE XXVI
(continued)

Course	Semester hours in Institutions 1	7	5	9	11
ENGLISH					
Freshman English	6		6	6	3
Speech	6				2
Technical English (Written)		3		1 1/3	3
Technical English (Oral)		3			
MATHEMATICS					
Calculus					8
Mathematics Seminar				2/3	
Intermediate Algebra & Solid Geometry	4				
Trigonometry	3-4			3 1/3	
College Algebra	4-5			3 1/3	5
Analytic Geometry	4-5				4
Slide Rule	1				
Technical Mathematics (Algebra and Trigonometry)		4	4		
Technical Mathematics (Analytic Geometry-Calculus)		4	4		
Algebra				3 1/3	
PHYSICAL EDUCATION	2S	2S	2	1 1/3	2
PHYSICAL SCIENCE					
Practical Chemistry(or Col. Chemistry)			4		
Technical Physics (Heat, light, sound)		8		8	8
Practical Physics (Engr. Physics) .			3-4		
PSYCHOLOGY					
Applied Psychology					3
SOCIAL SCIENCE					
Sociology	3			2 2/3	
Political Science	3	3			
Man and Society			6		
Economics				2 2/3	
Socio-Economic Problems					3
TECHNOLOGY					
Machine Shop	3	4	3	2	
Measurement and Gaging		3			
Hydraulics and Fluid Mechanics . ..			2	2	
Jigs and Fixtures				2	
Welding and Foundry				3 1/3	
Total semester hours	65-68	63	64-65	79 1/3	68

The purpose of this program as stated in the catalog of Institution 1 was to provide training in vacuum tube and transistor circuit theory and applications. The catalogs of Institutions 1, 5, 7, and 9 stressed the opportunities of graduates in positions in industry as engineering aides, research assistants, and installation or maintenance technicians.

Institution 9 provided several courses in computer circuitry, printed circuits, testing methods, and transistor theory.

A study of the table points out other requirements: Institution 7 listed a course in employer-employee relations; Institution 11 required an 8 credit hour course in calculus; Institution 11 offered a course in applied psychology; and Institution 9 required a course in jigs and fixtures.

Engineering technology. According to Institution 1 the basic interest of an engineering technician was in the testing and development of products of industry; development, installation, and maintenance of engineering equipment and assisting in research. There was an absence of emphasis on shop courses. Table XXVII shows that machine shop is the only shop course required by both of the colleges offering this curricula.

Industrial technology. Institution 1 assumed that production and service were the prime concerns of the industrial technician, while Institution 8 took the position that the work of the industrial technician consisted mainly of planning and controlling the processes of efficient manufacturing. The required courses for the curricula is tabulated in Table XXVIII.

TABLE XXVII

THE INDUSTRIAL-TECHNICAL CURRICULA IN ENGINEERING TECHNOLOGY GIVEN BY THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions 1	3
BUSINESS		
Beginning Typewriting		2
ELECTIVES	12	
DRAFTING AND DESIGN		
Technical Drafting (Mechanical)	2	9
Architectural Drawing	2	
Descriptive Geometry		3
Shop Sketching		2
ENGLISH		
Business Communications		6
Freshman English	6	
Speech	3	3
MATHEMATICS		
Analytic Geometry	4	
College Algebra	4	
Mathematics elective		4
Technical Mathematics (Basic Applied) ..		12
PHYSICAL EDUCATION	4S	2
PHYSICAL SCIENCE		
Chemistry (General, Inorganic)	8	4
Chemistry (Engineering Materials)		3
Physics (Heat, light, sound, etc.) . . .	10	8
SOCIAL SCIENCE		
Economics	3	
Political Science	3	3
U. S. History	3	
TECHNOLOGY		
Machine Shop	6	2
Total semester hours	66	63

TABLE XXVIII

THE INDUSTRIAL-TECHNICAL CURRICULA IN INDUSTRIAL TECHNOLOGY GIVEN BY THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions 1	8	11	10
BUSINESS				
Cost Analysis (Time and Method Study)		3		
Industrial Relations		2		
Office Machines	3			
Typewriting	4			
DRAFTING AND DESIGN				
Technical Drafting (Mechanical)	4	12	6	9
Pattern Development			3	
ELECTRICITY AND ELECTRONICS				
Basic Electricity	8	2	3	
Basic Electronics			6	
ELECTIVES	14		3	
ENGLISH				
Freshman English Composition	6	3	3	6
Speech	3	2	2	
Technical Report Writing		2-3	3	
LEADERSHIP TRAINING				
Foremanship Training			3	
MATHEMATICS				
Basic Mathematics			6	
Technical Mathematics	3	12	6	16
PHYSICAL EDUCATION	4S	2	2	
PHYSICAL SCIENCE				
Chemistry (Introductory)				3
Physics (Introductory, Mechanics,etc.				3
Physics (Electricity, Heat, etc.). .		8		
Metallurgy		2	3	3
PSYCHOLOGY				
Applied Psychology			3	3
Industrial Psychology		2		
SOCIAL SCIENCE				
Economics	3	2		3
Political Science	3	3		3
Socio-Economic Problems			3	
U. S. History	3			
TECHNOLOGY				
Heat Treating			3	
Industrial Inspection		2		

TABLE XXVIII
(continued)

Course	Semester hours in Institutions 1	8	11	10
Industrial Materials		2		
Machine Shop	6	4	12	6
Manufacturing Processes				3
Metal Fabrication(Jigs, Fixtures,etc.)				3
Welding			3	
Total semester hours	63	66-67	70	64

Four colleges have programs in industrial technology. Cost analysis and industrial relations business courses are required by Institution 8 while office machines and typewriting are required by Institution 1.

Less mathematics and drafting was listed for this program and more courses in technology than in several of the curricula previously analyzed. Each of the 4 colleges required from 4 to 12 semester hours of machine shop, recognizing this as a basic course in manufacturing processes.

Only Institution 3 required a course in foremanship training. Three of the 4 colleges required courses in psychology.

Industrial management technology. Industrial management technology was a separate program available only in Institution 2 of the community junior college. The requirements are contained in Table XXIX.

There is added emphasis in the area of business and in courses similar to industrial engineering beginning courses.

No provision is made for physical sciences and only eight semester hours of technical mathematics are included in this curriculum. The drafting requirement has been reduced to one basic 3 semester hour course.

TABLE XXIX

THE INDUSTRIAL-TECHNICAL CURRICULA IN INDUSTRIAL MANAGEMENT GIVEN BY INSTITUTION 2 DURING 1960-61

Course	Semester hours in Institution 2
BUSINESS	
Fundamental Accounting	4
Introduction to Business	3
Principles of Management	3
Personnel Management	3
Marketing	3
DRAFTING AND DESIGN	
Basic Drafting	3
ENGLISH	
Freshman English Composition	3
Technical English	3
MATHEMATICS	
Technical Mathematics (Applied Basic).	8
PSYCHOLOGY	
Industrial Psychology	3
SOCIAL SCIENCE	
Economics	6
Political Science	3
TECHNOLOGY	
Machine Operation	6
Fundamentals of Automation	2
Production Planning	3
Quality Control	3
Motion and Time Study	3
Total semester hours	62

Two economics courses have been introduced into this curricula.

Mechanical technology. The great variations in "depth" and "breadth" (See Table XXX.) is indicated by an analysis of the course requirements of 5 of the colleges offering this program.

In some cases it is difficult to discern the areas of major emphasis by some of the community junior colleges. The difference

TABLE XXX

THE INDUSTRIAL-TECHNICAL CURRICULA IN MECHANICAL TECHNOLOGY GIVEN BY THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES OFFERING THIS PROGRAM DURING 1960-61

Course	Semester hours in Institutions				
	4	6	7	2	9
BUSINESS					
Communications and Human Relations		3			
Cost and Time Study				3	2
Industrial Management	3		4	3	2
Industrial Relations	3		3		
DRAFTING AND DESIGN					
Descriptive Geometry					2
Design Origination					2
Die Design					2
Electrical and Electronic Drawing.					2
Machine Design (Kinematics)					2 2/3
Technical Drafting (Mechanical) ..	4	12	7	6	4
ELECTIVES			8-10		
ELECTRICITY AND ELECTRONICS					
Basic Electricity	2	3		3	2
Basic Electronics	2			3	4 2/3
Industrial Electronics					2 2/3
ENGINEERING					
Engineering Lectures (Orientation).	1				
Engineering Problems (Elementary)..	2				
Mechanics		2			
Strength of Materials & Practical Mechanics	3				2 2/3
Mechanism	3				

TABLE XXX
(continued)

Course	Semester hours in Institutions 4	6	7	2	9
ENGLISH					
Composition and Rhetoric(Technical	3				
Freshman English Composition . . .		6		3	6
Technical English			6	3	
Technical Report Writing	3				
MATHEMATICS					
Algebra	3				3 1/3
College Algebra					3 1/3
Mathematics Seminar					2/3
Technical Mathematics(Algebra) . .	3				
Technical Mathematics (Geometry, Trigonometry, Calculus, etc.). .			8		
Technical Mathematics(Basic Applied)		9		8	
PHYSICAL EDUCATION	2S	2	2S		1 1/3
PHYSICAL SCIENCE					
Chemistry (Technical)	3				2 2/3
Industrial Science (Chemistry & Strength of Materials)			4		
Physics(Electricity, heat, light, sound, statics, dynamics, etc.).	3			8	8
Physics (Heat, light, sound) . . .		2			
Metallurgy	3	2		3	2
PSYCHOLOGY					
Industrial Psychology	3			3	
SOCIAL SCIENCE					
Economics			3-4		2 2/3
Political Science	3	4	3	3	
Sociology					2 2/3
TECHNOLOGY					
Fundamentals of Automation				2	
Hydraulics and Fluid Mechanics . .		3	2		2
Industrial Materials		2			
Jigs and Fixtures					2
Machine Shop	24	3	8	6	2
Manufacturing Processes(Foundry) .	4	3	4		
Materials Testing	3			3	
Measurement and Gaging		2	2	3	
Welding		4	2		
Welding and Foundry					3 1/3
Total semester hours	81	62	64-67	63	80

between the courses in terms of semester hours is so minute as to make it difficult to ascertain what the major emphasis is in some of these colleges.

Institution 4 stated that the actual operation of machines and later the fabrication of tools and dies would be stressed.

Institution 6 listed the important areas in mechanical technology as being mechanical design, industrial inspection, and metal processing. However, it offered only one 2 credit course in industrial inspection and one 3 credit course in machining. Its major concentration probably was in the area of drafting and design.

Institution 7 required for entrance into the curriculum one high school unit of either chemistry or physics and one of algebra and one in geometry or their election without credit. Institution 7 stated that the training in mechanical technology is designed to give students the background required for positions as follows: supervision in operating a department; plant operation and maintenance; technical services such as drafting, testing, inspecting; technical sales work; and/or industrial relations. It thus required courses in both industrial management and industrial relations.

Institution 2 stated in its literature that it prepared students for careers in the production, operation and control phase of industry, stressing the actual operation of machines.

While Institution 9 did not indicate its objectives in the catalog, it did list a number of titles of possible positions for graduates of this program. It placed heavy emphasis on drafting, physical science and technology, with lesser emphasis on mathematics, electricity, and business.

Metallurgical technology. Only Institution 5 offered a program. The content of the curricula is given in Table XXXI. The program purpose, according to the descriptive literature, was to provide training

TABLE XXXI

THE INDUSTRIAL-TECHNICAL CURRICULA IN METALLURGICAL TECHNOLOGY GIVEN BY INSTITUTION 5 WHICH OFFERED THIS PROGRAM DURING 1960-61

Course	Semester hours in Institution 5
DRAFTING AND DESIGN	
Basic Drafting	3
ELECTIVES	6
ENGLISH	
Freshman English Composition	6
MATHEMATICS	
Technical Mathematics(Practical Applied).	6-8
METALLURGY	
Basic Metallurgy	2
General Metallography	3
Mechanical Testing	2
Advanced Metallography	3
Qualitative Analysis of Steel	2
PHYSICAL EDUCATION	2
PHYSICAL SCIENCE	
Chemistry)Practical, or General). . . .	4
Physics (Practical, or General)	4
SOCIAL SCIENCE	
Man and Society	6
TECHNOLOGY	
Automotive	2
Hydraulics	2
Industrial Materials	3
Machine Tools	3
Metal Processing(Heat Treating & Welding)	3
Total semester hours	62-64

for those interested in positions in metallurgical testing laboratories, in routine chemical and physical testing laboratories of the metals field, as well as similar testing divisions in the plastic field.

An analysis of the course offerings revealed only very minor emphasis on drafting, mathematics, and social science with heavy emphasis on metallurgy, physical science and technology.

Admission requirements. The admission requirements of the 13 public community junior colleges listing courses in industrial-technical curricula in their catalogs is presented in Table XXXII.

Three of the colleges listed only high school graduation as the requirement for admission, while 5 others indicated admission on the basis of either high school graduation or having passed the General Education Development test or other specific entrance examination. Two of the colleges specified an accredited high school certificate with 15 units including one each in algebra, geometry, and physics or chemistry. Another college accepted students on programs for which they possessed the proper background without regard to high school graduation.

One college attempted to control admission by admitting students to industrial-technical curricula on the basis of graduation from high school and specific courses in shop and mathematics.

Graduation requirements. The number of semester hours required for graduation was set at 62 (See Table XXXIII.) except for Institution 4 which required 83 semester hours including 2 of physical education for graduation.

While some of the colleges did not indicate the number of semester hours that needed to be earned in residence, others placed the residence requirement between 15 and 30 semester hours.

TABLE XXXII

THE ADMISSION REQUIREMENTS OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES IN THE INDUSTRIAL-TECHNICAL CURRICULA AS GIVEN IN THE MOST RECENTLY PUBLISHED CATALOGS

Requirement	Required by Institutions
Graduate of accredited high school	1, 10, 13
Graduate of high school or having passed G.E.D. test or other entrance examinations . . .	2, 3, 6, 9, 11
Graduate of an accredited high school with 15 units including one of algebra, one of geometry, and one each of physics or chemistry	4, 7
Individuals accepted on programs for which they have the proper background, not restricted to high school graduates	5
Graduate of high school with specific courses in shop and mathematics	8
Graduate of high school with average of "C" or better	12

NOTE: The most recently published catalog of the institutions was:
Institution 3 -- 1959-61
Institutions 1 and 9 -- 1960-61
Institutions 2, 6, 7, 8, 10, 11 and 12 -- 1961-62
Institutions 4, 5, and 13 -- 1961-63

TABLE XXXIII

THE GRADUATION REQUIREMENTS OF THE MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES IN THE INDUSTRIAL-TECHNICAL CURRICULA AS GIVEN IN THE MOST RECENTLY PUBLISHED CATALOGS

Requirement	Required by Institutions
62 semester hours with 124 honor points; must include three credits of Political Science, six credits of English, and two credits of Physical Education with at least 15 semester hours completed in residence	1, 10, 11
Same as above except 17 semester hours in residence	5
Same as above except 20 semester hours in residence	12, 13
Same as above except 30 semester hours in residence.	2
Same as above except no indication given of residence requirement	3, 6, 7, 8, 9
83 semester hours with 176 honor points	4

NOTE: The most recently published catalog of the institutions was:
- Institution 3 -- 1959-61
- Institution 1 and 9 -- 1960-61
- Institutions 2, 6, 7, 8, 10, 11, and 12 -- 1961-62
- Institutions 4, 5, and 13 -- 1961-63

In most cases the student was required to have an honor point ratio of at least 2 (average grade of C) for graduation. Institution 3 granted the degree only to graduates having an honor point ratio of 2 and a certificate to those having earned an honor point ratio of 1.5.

Summary. Thirteen public community junior colleges listed in their catalogs 38 programs constituting 13 different curricula of an industrial-technical nature. While 2 institutions offered only 1 curricula each, 2 others each offered 5. Drafting technology, electrical and electronics technology, and mechanical technology were the most frequently offered curricula. Architecture, body drafting technology, industrial management technology, and metallurgical technology were the least frequently offered curricula by these colleges.

The most common admission requirement was graduation from high school, although 3 colleges employed criteria requiring the applicant to have certain specific courses prior to enrollment in addition to a high school diploma.

While most of the colleges required 62 semester hours with an honor point ratio of 2, one of the colleges required 83 semester hours for graduation with an honor point ratio of 2.

CHAPTER V

CHARACTERISTICS OF THE STUDENTS

To identify and characterize the types of students in the industrial-technical programs, information was secured from former students and graduates who had participated in these programs in these public community junior colleges (PCJC) of Michigan.

Students whose initial enrollment occurred during the school year 1958-59 in any of the programs of the 8 participating colleges were invited to respond to a questionnaire. Two hundred ninety-seven of the 412 of the total population did respond. This constituted 72 per cent of the total population. For purposes of study, each of the stratified populations of the eight groups was kept intact. After tabulations had been completed seven additional returns were received. All percentages have been rounded to the closest whole number only.

Credit hours of colleges operating on a quarter-hour system have been converted to semester hours for ease of comparison.

The questionnaire contained 76 items which were analyzed according to colleges attended and the curricula the respondents studied.

Most of the data is presented in two types of tables: one type relates to the colleges attended and the other to the program studied. The two-way tables in most cases provide percentages and totals on the right and also at the bottom for each stratified population consisting of the colleges or of the programs reading vertically on the table, and the analysis of each of the parts of the item being analyzed, reading horizontally on the table.

The number and percentage of respondents who graduated from the institutions attended are indicated in the tables of the series related to "colleges". A subtraction from 100 provides the percentage of students in each case who had not graduated. To secure the number of respondents who had not graduated subtract the number of graduates (101) from the total number of respondents (297).

<u>General Information Relative to Respondents</u>

In this part a number of factors characterizing the respondents is summarized. The data is related to such characteristics as age at the time of initial enrollment, marital status, residence while attending college, and previous grades earned.

To maintain anonymity each of the colleges was designated by code. Table XXXIV gives the number of students who responded from each of the 8

TABLE XXXIV

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE

	Institution								Total	Graduates	
	2	5	6	7	8	9	10	11		No.	Per cent
Respondents	9	67	93	25	20	43	20	20	297	101	34
Per cent	3	23	31	8	7	14	7	7	100		

colleges. Institution 6 had the largest number of respondents, 93, while Institution 2 had 9 respondents. The 9 respondents of Institution 2 composed a 100 per cent response of this stratified population.

Age. The age of the respondents at the time of first enrollment at the community junior college is shown in Table XXXV by colleges and in Table XXXVI by type of industrial-technical program.

TABLE XXXV

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO AGE AT THE TIME OF FIRST ENROLLMENT AT COMMUNITY JUNIOR COLLEGE

Age	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
17-18	4	50	36	17	10	20	10	13	160	54	59	36
19-20	3	8	20	5	5	10	3	5	59	20	20	34
21-22	1	4	9	2	2	1	2	0	21	7	5	24
23-24	0	0	11	1	1	8	2	1	24	8	9	37
25-26	0	4	2	0	1	1	2	1	11	4	5	45
27-28	0	0	5	0	0	0	0	0	5	2	0	0
29-30	0	0	1	0	0	1	0	0	2	1	1	50
31-32	0	0	0	0	0	0	0	0	0	0	0	0
33-34	0	0	0	0	0	0	0	0	0	0	0	0
35-36	0	0	0	0	0	1	0	0	1	0	1	100
37-38	0	0	1	0	0	0	0	0	1	0	0	0
39-40	0	0	0	0	0	0	0	0	0	0	0	0
41-42	1	0	0	0	0	0	0	0	1	0	0	0
43 and over	0	0	0	0	0	0	0	0	0	0	0	0
Not given	0	1	8	0	1	1	1	0	12	4	1	8
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE XXXVI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS WHO INDICATED THE FOLLOWING AGE AT THE TIME OF INITIAL ENROLLMENT

Age	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
17-18	16	1	7	34	8	15	8	0	19	37	9	3	3	160	54
19-20	0	1	5	12	7	3	3	1	7	13	2	4	1	59	20
21-22	2	0	0	1	7	2	0	0	2	6	1	0	0	21	7
23-24	0	0	5	2	5	3	1	0	4	2	0	2	0	24	8
25-26	1	0	1	0	2	2	0	0	4	0	1	0	0	11	4
27-28	0	0	0	0	2	2	0	0	0	0	0	1	0	5	2
29-30	0	0	1	0	1	0	0	0	0	0	0	0	0	2	1
31-32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33-34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35-36	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
37-38	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
39-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41-42	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
43 and over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Not given	0	0	0	0	2	0	0	0	2	5	1	2	0	12	4
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

The organization of Table XXXV provides both the total number and the per cent of the total population for each of the age groups and for each of the participating institutions.

Approximately 75 per cent of the enrollees were under 21 years of age at the time of initial enrollment, and over 50 per cent of them were in the 17-18 year old group. Only 3 of the 297 participants were over 30 years of age. In fact, only 3 of the institutions had any enrollees who were over 26 years of age. Approximately 80 per cent of the graduates were between the ages of 17 and 20 inclusively as shown in Table XXXV.

In Table XXXVI the analysis of the ages of the enrollees is given by programs.

Study of the table shows that 16 of the 19 students who began the study of automotive technology were 17 or 18 years old. Nine of the 14 beginning the study of metallurgical technology were also in the 17-18 year-old group. On the other hand nearly one-half of those starting the program in civil technology were 23 years or older, and approximately 1 of every 3 students starting the electrical technology program were 23 years or older.

Only 3 students over the age of 30, initially enrolled in any of these programs. Civil technology, electrical technology, and industrial technology each had 1 student over 30 years of age.

Marital status. Fifty-four per cent of the respondents were single as compared with 12 per cent who were married prior to attendance at college. Over one-half of the graduates who responded were single while in college. According to Table XXXVII 24 per cent married after graduation or termination of college. Only 1 of the 297 respondents was divorced and no one was widowed. From Institution 5, two-thirds of the respondents were single while Institution 2 had seven-ninths of its respondents married.

Definite variations existed within certain curricula as to the

TABLE XXXVII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO MARITAL STATUS

Marital status	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Single	2	48	40	14	10	25	9	13	159	54	55	34
Married before enrollment	1	2	20	0	4	7	2	1	37	12	11	29
Married during attendance	2	5	9	1	3	5	1	0	26	9	10	38
Married after termination	4	12	21	10	3	8	8	6	72	24	25	34
Divorced	0	0	1	0	0	0	0	0	1	0	0	0
Not given	0	0	2	0	0	0	0	0	2	1	0	0
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

marital status as shown in Table XXXVIII. While 13 of the 19 respondents in automotive technology were single only 17 of the 39 respondents in industrial technology were single. Half of the students in engineering technology and 55 per cent of the students in civil technology were married.

The highest number of respondents marrying during enrollment occurred among enrollees in the electrical technology. While the number of enrollees was small in architectural technology, engineering technology, and industrial management technology, no one pursuing these curricula was married during attendance at college.

Residence. Difference in tuition between resident and non-resident students is only one of the reasons why it is important to know the residence of the students. This information is given in Table XXXIX. The table provides information about the total of each group and the per cent of the total population. Table XXXIX indicates that slightly over half of the enrollees were residents of the local district; whereas, 46 per cent were not residents of the local district during a part of the time of attendance. Most of the non-residents were, however, residents of Michigan. Only 2 per cent of the enrollees checked the blank denoting residence in a state other than Michigan. Four per cent indicated that they had been a resident of the community part of the time and also, non-resident of the community part of the time while attending the community junior college. Three of the colleges had no out-of-state students in attendance. The percentage of residents and non-residents who graduated

TABLE XXXVIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS WHO INDICATED MARITAL STATUS AS GIVEN BELOW

Marital status	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Single	13	2	9	31	15	16	6	1	17	34	8	3	4	159	54
Married prior to enrollment	0	0	3	0	10	7	1	0	6	4	1	5	0	37	12
Married during attendance at college	1	0	2	2	5	3	0	0	4	4	2	3	0	26	9
Married after termination of college	5	0	6	16	4	1	5	0	12	19	3	1	0	72	24
Divorced	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Not given	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

were about the same as the percentage of the total population who were residents or non-residents.

In Table XXXIX the residence of the respondents is shown by each of the technologies. In two of these, automotive technology and metallurgical technology, the non-resident group from Michigan, was larger than the resident group.

TABLE XXXIX

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO RESIDENCE WHILE ATTENDING THE INSTITUTION

Residence while at college	2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Resident	5	25	54	16	13	25	13	9	160	54	55	34
Non-resident from Michigan	2	40	34	8	5	14	6	11	120	40	43	36
Non-resident from other states	0	1	1	1	1	0	1	0	5	2	1	20
Resident part time	2	1	4	0	0	4	0	0	11	4	2	18
Not given	0	0	0	0	1	0	0	0	1	0	0	0
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE XL

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO RESIDENCE WHILE ATTENDING THE INSTITUTION

Residence while attending college	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Resident of district	8	1	10	24	21	16	8	1	22	32	6	7	4	160	54
Non-resident of district but from Michigan	10	1	7	23	10	11	4	0	15	27	8	4	0	120	40
Out-of-state non-resident of district	1	0	0	0	1	0	0	0	1	1	9	1	0	5	2
Resident part of the time;non-resident part of the time	0	0	3	2	2	0	0	0	1	3	0	0	0	11	4
Not given	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Approximately two-thirds of the enrollees in electrical technology, engineering technology, industrial management technology, and industrial technology were residents of the local school district.

Previously enrolled in another college or university. The extent to which enrollees in the community junior colleges in industrial-technical curricula had demonstrated interest in attending other institutions of higher education is given in Tables XLI, XLII, and XLIII.

About 31 of the 297 students had participated in an educational experience at another college or university; this constituted less than 10 per cent of the total group. However, 14 of the 101 students who had graduated had attended another college previously.

TABLE XLI

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FROM EACH COLLEGE HAVING PREVIOUSLY BEEN ENROLLED IN ANOTHER COLLEGE OR UNIVERSITY

Previously enrolled in another college or university	Institution								Total	Per cent	Graduates No.	Graduates Per cent
	2	5	6	7	8	9	10	11				
Yes	0	7	8	2	2	9	2	1	31	10	14	46
No	9	59	84	23	18	34	18	19	264	89	87	32
Not given	0	1	1	0	0	0	0	0	2	1	0	0
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE XLII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS HAVING PREVIOUSLY BEEN ENROLLED IN ANOTHER COLLEGE OR UNIVERSITY

Previously enrolled in another college or university	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	1	1	6	2	4	1	2	0	3	4	3	4	0	31	10
No	18	1	14	47	30	27	10	1	36	58	11	8	3	264	89
Not given	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

TABLE XLIII

NUMBER OF STUDENT RESPONDENTS INDICATING PREVIOUS ATTENDANCE AT THE FOLLOWING COLLEGES AND UNIVERSITIES

Number of students	Institution	Address
5	Michigan State University	East Lansing, Michigan
4	General Motors Institute	Flint, Michigan
3	Eastern Michigan University	Ypsilanti, Michigan
3	Lawrence Technical Institute	Detroit, Michigan
2	Wayne State University	Detroit, Michigan
1	Flint Community Junior College	Flint, Michigan
1	Henry Ford Community College	Dearborn, Michigan
1	Alabama State College	Florence, Alabama
1	Western Michigan University	Kalamazoo, Michigan
1	Calvin College	Grand Rapids, Michigan
1	Coyne Electronics	Chicago, Illinois
1	Toledo University	Toledo, Ohio
1	Jackson Junior College	Jackson, Michigan
1	University of Illinois	Urbana, Illinois
1	Ferris Institute	Big Rapids, Michigan
1	Graceland College	Lamoni, Iowa
1	Alma College	Alma, Michigan
1	Kalamazoo College	Kalamazoo, Michigan

Further insight into the matter of transfer students may be gained by the study of Table XLII. This table reveals that in the cases of architectural technology, and civil technology nearly one-half or more of the students had previously enrolled in another college or university. However, only 2 students were respondents enrolled in architectural technology, of which 1 was a transfer student.

None of the students who changed curriculum had been previously enrolled in another college or university; whereas, one-half of those who did not indicate their program had been enrolled previously in some other college or university.

While the enrollees who had previously attended other institutions were divided among 18 different institutions, most of them had attended 1 of 5 Michigan colleges or universities. In Table XLIII is a list of the institutions mentioned as previously attended by the transfer students.

Only 5 of the 31 students who transferred had enrolled at out-of-state schools. Three of those who transferred had previously enrolled in some other public Michigan community junior college as shown in Table XLIII.

Father's occupation. Table XLIV describes the father's occupation at the time of the respondent's enrollment.

One of every 4 fathers was a skilled laborer while 1 out of every 5 fathers was a semi-skilled laborer. Twelve per cent of the fathers were unskilled at the time of the son's enrollment.

The number of students indicating fathers who were engaged in sales work or in service work was very small. Likewise, only 3 per cent

TABLE XLIV

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO THE FATHER'S OCCUPATION AT THE TIME OF ENROLLMENT AT COMMUNITY JUNIOR COLLEGE

Father's occupation at time of enrollment	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Unskilled labor	0	6	16	4	0	1	3	5	35	13	11	31
Semi-skilled labor	2	14	20	2	3	11	4	3	59	21	18	31
Skilled labor	3	25	23	4	5	8	4	2	74	26	32	43
Professional	0	3	2	1	0	1	1	0	8	3	4	50
Business owner	0	1	8	2	1	2	2	2	18	6	4	27
Farm worker	0	0	2	0	3	5	3	0	13	4	9	69
Manager or executive	1	7	4	3	4	5	1	2	27	6	11	41
Clerk or sales worker	0	2	1	1	2	1	0	1	8	3	0	00
Service worker	0	2	1	0	0	1	0	1	5	2	2	40
Other occupation	1	4	4	5	1	5	1	3	24	8	4	17
Other as father deceased or disabled	1	3	11	2	1	2	1	1	22	7	5	23
Not given	1	0	1	1	0	1	0	0	4	1	1	25
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

indicated that the father was engaged in a profession while 6 per cent listed manager or executive as the occupation of the father.

Ownership of the source of income was true of approximately 10 per cent of the father's occupation. Six per cent of these were business owners and 4 per cent were agricultural workers. Some of the agricultural workers undoubtedly were farm owners.

The percentage of fathers in the unskilled labor group was larger than 12 per cent in the group represented by students at Institutions 6 and 11 and smaller at Institutions 2, 8, and 9. Only at Institution 5 was the professional category represented by approximately 5 per cent of the sons. Institutions 5 and 9 had a larger than average representation from the category "manager or executive".

Table XLV suggests that approximately 25 per cent of the students entering automotive technology, drafting technology, and electrical technology came from homes where the father was an unskilled laborer. None of the students entering architectural technology, civil technology, engineering technology or industrial management technology came from homes in which the father was listed as an unskilled laborer. The percentage distribution between the various technologies listed is about the same for semi-skilled and skilled laborers in each technology.

<u>Average high school grade</u>. The respondent was asked to indicate his average grade earned in high school. This information is contained in Table XLVI according to colleges attended and in Table XLVII according to the various curricula of the respondents.

According to Table XLVI none of the students had an average of E

TABLE XLV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO THE FATHER'S OCCUPATION AT THE TIME OF ENROLLMENT AT COMMUNITY JUNIOR COLLEGE

Father's occupation at the time of enrollment	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Unskilled labor	4	0	0	5	7	3	0	0	6	8	1	1	0	35	13
Semiskilled labor	1	0	5	13	5	3	2	0	9	16	3	2	0	59	21
Skilled labor	6	0	5	15	9	10	1	0	9	13	3	1	2	74	26
Professional	1	0	0	2	1	1	0	0	1	1	1	0	0	8	3
Business owner	0	0	0	0	1	0	4	0	2	8	1	1	1	18	6
Agricultural worker	0	0	2	0	1	1	0	1	4	3	0	1	0	13	4
Manager or executive	3	0	3	5	1	2	1	0	3	4	2	2	1	27	6
Clerk or sales worker	1	1	0	0	1	2	1	0	1	1	0	0	0	8	3
Service worker	0	0	1	0	0	1	1	0	0	1	1	0	0	5	2
Other occupation	2	1	3	5	2	2	1	0	2	4	1	1	0	24	8
Other as father deceased disabled	1	0	1	2	6	3	0	0	2	3	1	3	0	22	7
Not given	0	0	0	2	0	0	1	0	0	1	0	0	0	4	1
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	5	1	7	17	11	9	4	0	13	22	5	4	1		100

in high school; however, only 1 student said that he had an A average in high school. Sixty-five per cent of the students stated that they had C averages in high school. While 29 per cent claimed they had B averages, only 2 per cent admitted that they had D averages in high school.

If any distinction is to be made between the students of the various colleges on the basis of their high school performance it would seem that Institution 9 and Institution 2 had students with a higher high school average than the majority of the institutions studied. Institu-

TABLE XLVI

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO GRADES EARNED IN HIGH SCHOOL

Students' statement of average grade	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
A	0	0	0	0	0	1	0	0	1	0	0	00
B	4	23	16	7	6	20	8	2	86	29	38	44
C	4	43	63	16	14	20	12	18	192	65	61	32
D	1	1	3	1	0	0	0	0	6	2	2	35
E	0	0	0	0	0	0	0	0	0	0	0	00
Not given	0	0	9	1	0	2	0	0	12	4	0	00
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE XLVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE FOLLOWING GRADES EARNED IN HIGH SCHOOL

Students' statement of average grade	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
A	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
B	4	0	10	14	7	5	1	1	10	19	7	5	3	86	29
C	15	1	8	35	23	22	10	0	27	37	8	7	1	192	65
D	0	0	0	0	1	1	0	0	2	1	1	0	0	6	2
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Not given	0	1	1	0	3	0	1	0	0	6	0	0	0	12	4
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

tions 5, 6, and 11 were drawing heavily from students whose high school average was C or below.

While none of the students who graduated from college had straight A's in high school, 2 students who had a D average in high school did graduate from college. Most of the college graduates, 61 of 101, had a C average in high school.

In Table XLVII is shown the various technologies with the average high school grade indicated. The only student having an A average enrolled in civil technology. One half of the students in civil technology, and in metallurgical technology had B averages in high school. Only 1 of the 12 students in engineering technology had a high school average of B. Approximately 20 per cent of the students enrolling in automotive technology, electrical technology, electronics technology, and industrial technology had high school grades of B or better. Two of the 39 industrial technology students indicated a high school average of D. An average of D in high school was indicated by 1 student from each of the following: electrical technology, electronics technology, mechanical technology, and metallurgical technology.

Financial arrangement most important for attending college. Table XLVIII and XLIX reveal information in the important field of financing education.

Table XLVIII provides an analysis by colleges attended of the most important arrangements for financing the education of the respondents. Almost one-third of the respondents cited employment as the most important method of financing their education. Financial assistance from parents and personal savings were second and third in order of importance as methods of providing funds for securing the education Ten per cent

TABLE XLVIII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE FINANCIAL ARRANGEMENT MOST IMPORTANT FOR OBTAINING COMMUNITY COLLEGE EDUCATION

Most important financial arrangement	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Personal saving	3	12	20	4	6	3	1	3	52	18	13	25
Scholarship assistance	1	1	0	1	0	0	1	0	4	1	1	25
Financial assistance from parents	0	17	32	9	5	5	4	4	76	26	29	38
Financial assistance from others	0	0	0	0	0	1	0	0	1	0	0	00
Borrowed money	0	0	1	0	0	0	0	0	1	0	0	00
Work	3	19	20	6	6	20	10	7	91	32	31	34
GI bill	1	6	13	2	1	4	3	2	32	10	13	41
Other	0	1	1	0	1	3	0	1	7	2	2	29
Not given	1	11	6	3	1	7	1	3	33	11	12	36
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE XLIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE FINANCIAL ARRANGEMENT MOST IMPORTANT FOR OBTAINING COMMUNITY COLLEGE EDUCATION

Most important financial arrangement	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Personal saving	5	1	0	8	3	5	2	1	8	12	2	4	1	52	18
Scholarship assistance	1	0	0	1	0	0	0	0	1	1	0	0	0	4	1
Financial assistance from parents	4	0	0	15	9	6	3	0	9	23	3	2	2	76	26
Financial assistance from others	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Borrowed money	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Work	4	0	15	15	10	8	3	0	13	14	5	4	0	91	32
GI bill	1	0	1	2	8	6	1	0	6	3	2	2	0	32	10
Other	1	0	2	1	1	0	0	0	0	2	0	0	0	7	2
Not given	3	1	2	7	3	2	3	0	2	7	2	0	1	33	11
Total	19	2	20	40	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

still were recipients of the GI bill. Apparently scholarships are not utilized by many of the students in the industrial-technical curricula in the Michigan public community junior colleges as important aids in securing an education.

One out of every 2 students attending Institution 10 worked his way through college. Nearly as large a percentage managed in the same way at Institution 9.

Approximately 44 per cent of the students who graduated financed their education by personal savings or work. Only 1 per cent indicated scholarship assistance as the most important financial arrangement used in financing their education.

Students' Methods and Educational Achievement

The investigator has related together in this section data pertaining to a number of items reflecting the pattern of student approach to his educational environment and the results of his endeavor. Considerations typical of this section relate to the number of semesters attended and whether attendance was on a full or a part-time basis. A factor related to such data is the matter of whether attendance was continuous or intermittent. Other similar items compose this section as well as tabulation of the statement of grades earned in college by the students.

Full-time college work. The number of semesters of full-time college work as indicated by the students is given in Table L and LI.

Table L, listing the information by colleges attended, emphasizes the great variation in the mean number of full-time semesters attended by students in the various participating colleges. In Institution 10 the mean was 4 semesters while in Institution 6 it was only 2 semesters. In all other participating colleges, with the exception of Institution 9, the mean number of full-time semesters attended was 3. Institution 9

TABLE L

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO THE NUMBER OF SEMESTERS OF FULL-TIME COLLEGE WORK TAKEN

Number of semesters	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Per cent
None	0	2	18	2	1	2	2	1	28	9	5	18
1	1	4	19	3	0	1	0	1	29	10	2	7
2	2	15	18	4	1	4	1	1	46	15	3	7
3	3	4	7	4	1	7	1	3	30	10	3	10
4	2	21	15	12	7	2	15	12	86	29	45	52
5	0	15	6	0	5	2	0	1	29	10	21	72
6	1	3	1	0	0	20	1	0	26	9	18	69
7	0	0	0	0	0	1	0	0	1	00	1	100
8	0	1	0	0	1	0	0	0	2	1	2	100
9	0	0	0	0	0	3	0	0	3	1	1	33
Other	0	2	3	0	2	0	0	1	8	3	0	00
None given	0	0	6	0	2	1	0	0	9	3	0	00
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7			34	
Mean attended	3	3	2	3	3	5	4	3				

TABLE LI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO THE NUMBER OF SEMESTERS OF FULL-TIME COLLEGE WORK TAKEN

Number of semesters	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
None	0	0	0	2	5	6	2	0	3	8	1	1	0	28	9
1	1	0	0	1	9	0	1	0	1	15	0	0	1	29	10
2	1	0	1	15	3	4	1	0	5	11	2	2	1	46	15
3	1	1	2	7	0	4	1	0	3	9	1	1	0	30	10
4	9	1	0	15	7	8	5	0	22	10	6	1	2	86	29
5	4	0	2	6	6	1	1	0	2	0	3	4	0	29	10
6	2	0	14	0	1	2	0	0	1	5	1	0	0	26	9
7	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8	1	0	0	0	0	0	0	1	0	0	0	0	0	2	1
9	0	0	1	0	0	1	0	0	0	1	0	0	0	3	1
Other	0	0	0	3	1	0	0	0	2	1	0	1	0	8	3
Not given	0	0	0	0	2	1	1	0	0	3	0	2	0	9	3
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

operated on the quarter-hour basis. The mean for this institution was 5 quarters of full-time attendance.

Nine per cent of the respondents did not attend college at all on a full-time basis. Two students indicated 8 semesters and 3 students checked 9 semesters of full-time college work. Over 40 per cent of the 101 students who graduated attended more than the 4 semesters usually required to complete the program.

Thirty-four per cent of the students indicated less than 3 semesters or equivalent of full-time college work. In Institution 6, 55 per cent of the respondents attended for 2 semesters or less on a full-time basis.

The number and percentage of student respondents by programs is shown in Table LI. The largest percentage, 29, reflects full-time college work of 4 semesters or equivalent. Of the 39 respondents having enrolled in industrial technology, 22 completed 4 or more semesters or equivalent of full-time college work. Over one-third of the students in mechanical technology completed 1 semester or less while about two-thirds of the enrollees in civil technology completed 14 or more semesters or the equivalent of full-time college work. Even though 14 of the 34 respondents in electrical technology took 1 semester or quarter or less, 17 of the 34 students took 4 semesters or more.

One person from each of mechanical technology, and electronics technology as well as 1 from civil technology indicated having taken 9 semesters of full-time college courses.

Part-time college work. The extent to which the students participated in part-time college work is the subject of Table LII and Table LIII.

In Table LII the amount of part-time college work is given by colleges. Thirty-six per cent did not have any part-time college work, while 15 per cent had 1 semester of part-time work and 13 per cent had 2 semesters of part-time college work. The percentage of students who took

TABLE LII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO THE NUMBER OF SEMESTERS OF PART-TIME COLLEGE WORK TAKEN

Number of semesters	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
None	1	27	28	9	2	17	12	11	107	36	39	36
1	3	7	20	3	4	5	2	1	45	15	17	38
2	2	11	12	6	3	1	0	3	38	13	10	26
3	1	4	5	1	3	7	1	3	25	8	9	36
4	0	3	7	0	1	4	2	0	17	6	9	53
5	1	2	4	0	2	2	0	0	11	4	4	36
6	0	7	3	1	3	3	1	0	18	6	2	11
7	0	0	1	1	1	0	0	0	3	1	0	00
8	0	0	2	0	0	0	0	0	2	1	0	00
9	0	0	0	0	1	0	0	0	1	0	0	00
Other	0	1	4	0	0	0	0	0	5	25	1	20
None given	1	5	7	4	0	4	2	2	25	8	10	40
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean attended	2	2	2	1	3	2	1	1				

TABLE LIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO THE NUMBER OF SEMESTERS OF PART-TIME COLLEGE WORK TAKEN

Number of semesters	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
None	12	0	13	16	8	10	2	0	17	21	5	3	0	107	36
1	1	0	2	8	8	3	2	0	8	10	1	1	1	45	15
2	2	1	0	11	5	2	2	1	2	8	1	1	2	38	13
3	0	0	1	3	3	4	3	0	3	5	3	0	0	25	8
4	0	0	1	0	4	3	1	0	1	4	1	2	0	17	6
5	1	0	0	0	1	2	0	0	1	3	0	2	1	11	4
6	1	0	2	5	2	2	0	0	1	3	2	0	0	18	6
7	0	0	0	1	0	1	0	0	1	0	0	0	0	3	1
8	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1
9	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Other	0	0	0	1	1	0	0	0	1	2	0	0	0	5	2
Not given	2	1	1	4	2	1	2	0	3	6	1	2	0	25	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

more than 3 semesters of part-time college work becomes rather small. Only 1 per cent had as many as 8 semesters of part-time college.

One student of every 3 utilized the opportunity for part-time classes at Institution 2. One student out of 6 took part-time courses for 3 semesters at Institution 9. At Institution 5, approximately one student in 10 participated in part-time college work for 6 semesters.

In the table, a mean has been determined by colleges as an aid in making comparisons. The mean value is based on the calendar period used by the college.

The significance of availability of part-time classes by programs is apparent in Table LIII. Over one-half of all the student respondents had taken some work in college on a part-time basis. Also, nearly 50 per cent of the graduates had taken some part-time college work. Over 60 per cent of the respondents in the following programs had not taken part-time classes: automotive technology and civil technology. Approximately two-thirds of the respondents enrolled in electrical technology and in engineering technology availed themselves of the opportunity to take 1 or more semesters of part-time college work. Two students in industrial technology and 1 student in mechanical technology were enrolled in part-time college work for 8 or more semesters.

Semester hours earned. The picture of how many semester hours were earned by students enrolled in the various colleges is given in Table LIV while Table LV relates this information to the programs of study.

A review of Table LIV indicates that more than 10 per cent of those enrolled took less than 13 semester hours of work. In fact, in

TABLE LIV

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE ACCORDING TO TOTAL NUMBER OF SEMESTER HOURS EARNED IN COMMUNITY JUNIOR COLLEGES

Students' indication of semester hours earned	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
0-12	0	3	26	1	0	1	0	1	32	11	0	00
13-24	1	8	12	3	2	3	2	0	31	10	2	6
25-36	0	5	14	3	3	0	1	1	27	9	0	00
37-48	1	5	8	2	1	2	0	2	21	7	3	14
49-60	3	10	3	3	3	3	8	6	39	14	11	28
61-72	3	21	18	5	6	1	6	4	64	22	48	75
73-84	1	8	0	2	3	2	0	0	16	5	9	56
85-96	0	0	1	0	1	4	0	0	6	2	3	50
97-108	0	3	0	0	0	13	0	0	16	5	10	63
109-120	0	0	0	0	0	9	0	0	9	3	9	100
121 & over	0	0	0	0	0	2	0	1	3	1	1	33
Not given	0	4	11	6	1	3	3	5	33	11	5	15
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean hours earned	45	46	23	32	47	104	41	32				

TABLE LV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO THE TOTAL NUMBER OF SEMESTER HOURS EARNED IN COMMUNITY JUNIOR COLLEGE

Students' indication of semester hours earned	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
0-12	0	0	0	2	8	4	1	0	2	12	0	3	0	32	11
13-24	1	2	1	4	6	3	1	0	3	8	1	0	1	31	10
25-36	0	0	0	3	2	6	1	0	3	9	1	2	0	27	9
37-48	1	0	0	6	1	1	2	0	1	6	1	2	0	21	7
49-60	3	0	1	11	1	1	4	0	11	4	1	1	1	39	14
61-72	4	0	1	12	12	3	1	1	11	9	6	3	1	64	22
73-84	2	0	1	4	0	2	0	0	2	1	3	0	1	16	5
85-96	0	0	1	0	2	2	0	0	1	0	0	0	0	6	2
97-108	3	0	10	0	0	2	0	0	0	1	0	0	0	16	5
109-120	0	0	3	0	0	2	0	0	0	4	0	0	0	9	3
121 and over	0	0	2	1	0	0	0	0	0	0	0	0	0	3	1
Not given	5	0	0	6	2	2	2	0	5	9	1	1	0	33	11
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

in Institution 6, nearly one-third of the students completed 12 or fewer semester hours of college work. Another 10 per cent terminated their experiences in the community junior colleges after taking less than 25 semester hours of college work. Thirty per cent completed one year or less of college work and 50 per cent completed less than 62 semester hours of work. Nine of the students completed over 108 semester hours in the community junior colleges. For these people this was a great deal more than a two-year college experience. Sixteen of the 101 graduates earned less than the minimum 62 credits in the community junior colleges; therefore, these students transferred credits from other institutions.

A high percentage of the students who earned less than 13 semester hours, as reflected by Table LV, were concentrated in 2 programs; electrical technology and mechanical technology. No one earned less than 12 semester hours in any of the following programs: automotive technology, architectural technology, civil technology, industrial management technology, and metallurgical technology. Nearly one-half of the enrollees had terminated prior to the completion of 37 semester hours in the electrical technology, electronics technology, or the mechanical technology curricula. Ninety per cent of the students enrolled in civil technology completed 61 or more semester hours of college work. Over 50 per cent of the enrollees in metallurgical technology completed at least 61 semester hours of the program. Only approximately 20 per cent completed the program in mechanical technology and less than 10 per cent in engineering technology. Both of the students studying architectural technology terminated before having completed 25 semester hours. Two students in civil technology and 1 student in drafting technology earned more than 120 semester hours of college credit.

Continuous enrollment. For 86 per cent of the students enrolled, their college experience was a continuous one on a sequential program as shown in Table LVI by each of the participating colleges. The data by programs is contained in Table LVII. Ninety-five per cent of those who graduated participated continuously on a sequential program. The fact that only 5 per cent of the graduates had an intermittent college experience is very significant.

Only 13 per cent of the respondents engaged in an intermittent type of college education. All of the respondents from Institution 2 continued in college until final termination without interruption. Less than 10 per cent of the respondents from Institutions 11, 10, 8, and 5

TABLE LVI

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING CONTINUOUS ENROLLMENT IN COMMUNITY JUNIOR COLLEGE ON A SEQUENTIAL PROGRAM UNTIL GRADUATION OR TERMINATION

Continuous enrollment	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	9	59	71	22	19	38	18	18	254	85	96	38
No	0	6	20	3	1	4	2	2	38	13	5	13
Not given	0	2	2	0	0	1	0	0	5	2	0	0
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE LVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING CONTINUOUS ENROLLMENT IN COMMUNITY JUNIOR COLLEGE ON A SEQUENTIAL PROGRAM UNTIL GRADUATION OR TERMINATION

Continuous enrollment	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	18	2	19	42	27	25	9	1	34	52	14	8	3	254	85
No	0	0	1	6	7	3	2	0	5	10	0	3	1	38	13
Not given	1	0	0	1	0	0	1	0	0	1	0	1	0	5	2
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

followed a pattern of intermittent enrollment.

Table LVII provides information by programs as to the nature of the continuity of the college experience of the population studied. For instance, none of the students in the following curricula indicated a pattern of intermittent enrollment: automotive technology, architectural technology, industrial management technology, and metallurgical technology. Lack of a continuous pattern of enrollment was more evident in the programs of mechanical technology and electrical technology, in which cases over 15 per cent followed this pattern. The percentage of respondents indicating irregular enrollment in the drafting technology curriculum was approximately the same as for the total group.

<u>Completion of requirements in a two-year period</u>. The community junior colleges are considered two-year institutions. What percentage of students in the current study were successful in completing the requirements of their program in a two-year period? Table LVIII relates the analysis to the colleges attended and in Table LIX according to the programs at the community junior colleges.

According to Table LVIII, only 25 per cent of the respondents were able to complete the requirements of the program in the two-year period. Sixty-three per cent responded negatively to this question and 11 per cent did not reveal the nature of their experience.

Further insight is provided by a study of Table LIX. In this table the number and percentage of student respondents by programs who indicated completion of the requirements of the curriculum in a two-year period is shown. None of the students enrolled in architectural technology were successful in completing within this time. Approximately one-half of the students were able to complete the programs in the two-year period in automotive technology, civil technology, industrial technology, and metallurgical technology. Approximately 10 per cent of the respondents in electrical technology and mechanical technology completed the requirements during the two-year period.

Number of school years on program. The number of school years enrolled on this program is the subject of Tables LX and LXI.

The analysis of the number of school years on the program is covered by Table LX from the point of view of the college attended. Approximately one-fourth of the students spent 1 year on the program while about one-half of the students spent 2 years on the program. Less

TABLE LVIII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING COMPLETION OF REQUIREMENTS OF CURRICULA IN A TWO-YEAR PERIOD

Completion in a two-year period	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	0	19	6	5	8	16	13	8	75	25	62	83
No	8	36	82	17	11	20	6	8	188	64	28	16
Not given	1	12	5	3	1	7	1	4	34	11	11	32
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE LIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING COMPLETION OF REQUIREMENTS OF CURRICULA IN A TWO-YEAR PERIOD

Completion in a two-year period	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	11	0	12	9	3	6	2	1	17	5	5	3	1	75	25
No	4	2	6	33	29	19	6	0	20	52	7	8	2	188	64
Not given	4	0	2	7	2	3	4	0	2	6	2	1	1	34	11
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

than one-fifth of the students used 3 years on the program and only 4 per cent were enrolled on the program for 4 years. While approximately 80 per cent of the graduates devoted only 2 years to the program, 8 per cent required 3 years to complete the two-year program.

The program upon which students were enrolled for 1, 2, 3, and 4 years are reported in Table LXI. In two programs, mechanical technology and electrical technology, approximately one-third of the students were enrolled only 1 year. But, in electrical technology 13 of the 34 students were also enrolled for 3 years. Drafting technology enjoyed the distinc-

TABLE LX

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE NUMBER OF SCHOOL YEARS ENROLLED ON THE PROGRAM

Number of school years	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
1	0	12	37	8	0	7	0	2	66	22	1	2
2	3	26	26	9	11	21	16	13	125	42	80	64
3	4	14	16	4	6	8	1	1	54	18	8	15
4	1	3	4	1	1	0	1	0	11	4	1	9
Not given	1	12	10	3	2	7	2	4	41	14	11	27
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE LXI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE NUMBER OF SCHOOL YEARS ENROLLED ON THE PROGRAM

Number of school years	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
1	2	2	1	9	11	7	1	0	3	24	1	4	1	66	22
2	12	0	14	18	5	13	7	1	27	19	6	2	1	125	42
3	1	0	3	10	13	5	1	0	3	10	4	4	0	54	18
4	0	0	0	4	1	0	0	0	2	1	0	2	1	11	4
Not given	4	0	2	8	4	3	3	0	4	9	3	0	1	41	14
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

tion of having nearly 10 per cent of the students enrolled on the program for 4 years.

Grades earned in college. What were the average grades earned by the respondents in college? Summaries of the answers to this question are contained in Table LXII and LXIII.

While the information reported is based on the students' responses, a test check of validity employing the official records of Institution 6 based upon the students' statement of grades as compared with the official in the registrar's office revealed a validity of 70.9.

TABLE LXII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS BY COLLEGES ACCORDING TO GRADES EARNED IN COLLEGE

Students' statement of average grade	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
A	0	0	0	0	2	1	0	0	3	1	0	0
B	3	16	16	6	8	20	6	9	84	28	41	49
C	6	47	53	10	10	19	14	11	170	58	59	35
D	0	3	17	8	0	0	0	0	28	9	0	0
E	0	0	4	0	0	0	0	0	4	1	0	0
Not given	0	1	3	1	0	3	0	0	8	3	1	13
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Nearest mean grade	C	C	C	C	B	B	C	C				

TABLE LXIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO GRADES EARNED IN COLLEGE

Students' statement of average grade	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
A	0	0	0	0	1	1	0	0	0	0	0	1	0	3	1
B	6	0	10	11	11	9	2	0	13	16	3	2	1	84	28
C	13	1	9	31	15	14	8	1	24	32	11	8	3	170	58
D	0	0	0	6	5	3	1	0	1	11	0	1	0	28	9
E	0	0	0	0	2	0	0	0	0	2	0	0	0	4	1
Not given	0	1	1	1	0	1	1	0	1	2	0	0	0	8	3
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Only 1 per cent of the students reported earning grades in college of A or E. While 28 per cent said they earned an average grade of B, only 9 per cent of the students admitted having earned an average grade of D. Over half, 57 per cent to be exact, reported earning an average grade of C. The mean grade earned in 6 of the 8 colleges was C while in 2 of the colleges it was B. Forty-one of the 101 graduates said they earned grades of B while 59 stated their average grade was C.

Table LXIII which provides an analysis by program of the average grades earned in college shows that one of the 3 students having the average grade of A was enrolled in electrical technology and another was a student taking electronics technology. However, 2 of the 4 students who reported an average grade of E were also in electrical technology while the other 2 were studying mechanical technology. Not any of the students in automotive technology, architectural technology, civil technology, industrial management technology, or metallurgical technology reported earning average grades less than C. Approximately 15 per cent of the enrollees in mechanical technology and electronics technology indicated grade averages of D.

Students employed while attending college. Table LXIV and LXV describe the employment status of students while at college.

As shown through Table LXIV, 52 per cent of the students worked on part-time jobs and 22 per cent of the students held full-time jobs while attending college. Only 16 per cent of the students stated that they did not hold jobs. Sixty-six per cent of the graduates held part-time jobs and about 17 per cent held full-time jobs.

Electrical technology and electronics technology, as recorded in Table LXV, had the largest percentage of enrollees holding full-time jobs -- over 32 per cent. Next, in this category was industrial technology.

Nineteen of the 20 students in civil technology worked on part-time jobs as compared with 8 of the 19 enrollees in automotive technology who were employed on part-time jobs. About one-fourth of the students in automotive technology, drafting technology, and mechanical technology were not employed.

The only student taking industrial management technology was employed on a full-time job.

TABLE LXIV

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS BY COLLEGES WHO WERE EMPLOYED WHILE ATTENDING COLLEGE

Employment status while attending college	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Part-time job	6	38	34	13	10	30	11	9	153	52	67	44
Full-time job	3	10	28	1	7	4	5	8	66	22	17	26
No job	0	12	14	8	2	6	3	2	47	16	12	26
Not given	0	7	17	1	1	3	1	1	31	10	5	16
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE LXV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS WHO WERE EMPLOYED WHILE ATTENDING COLLEGE

Employment status while attending college	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Part-time job	8	0	19	27	14	16	7	0	20	28	8	5	1	153	52
Full-time job	3	0	1	8	11	9	2	1	11	11	4	5	0	66	22
No job	5	1	0	12	2	2	2	0	4	14	1	2	2	47	16
Not given	3	1	0	2	7	1	1	0	4	10	1	0	1	31	10
Total	19	2	20	49	34	23	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

<u>Average weekly income from employment while attending college.</u> Table LXVI provides an analysis by colleges attended of the average weekly income from employment while attending the community junior college.

TABLE LXVI

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE AVERAGE WEEKLY INCOME FROM EMPLOYMENT WHILE ATTENDING COMMUNITY JUNIOR COLLEGE

Average weekly income	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Less than $10	0	5	7	4	1	0	1	0	18	6	6	33
$10-$14	0	5	4	1	2	3	1	0	16	3	10	63
$15-$19	1	5	6	4	3	0	1	0	20	7	10	50
$20-$24	0	8	5	4	2	4	3	1	27	9	9	33
$25-$29	1	6	4	3	1	3	2	1	21	7	7	33
$30-$34	0	6	5	0	0	4	2	4	21	7	14	67
$35-$39	0	2	2	1	0	9	0	1	15	5	6	40
$40-$44	2	2	4	0	0	5	0	0	13	4	3	23
$45-$49	0	0	0	0	0	2	1	0	3	1	1	33
$50 & over	4	13	31	1	9	4	6	10	78	27	21	27
Not given	1	15	25	7	2	9	3	3	65	22	14	22
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

Twenty-one of the graduates earned weekly salaries of over \$50 while attending college. Twenty-seven per cent of all the respondents were earning \$50 or over per week while attending college. The next group in size, consisting of 9 per cent, earned between \$20 and \$24 per week. While 18 per cent earned less than \$20 per week, 31 per cent earned \$40 per week while going to college.

Further information concerning earnings is given in Table LXVII which provides the analysis by programs. Approximately 10 per cent of the employed students in drafting technology and mechanical technology earned less than \$10 a week while none of those enrolled in engineering technology who were employed earned less than \$20 per week. All of the students studying civil technology were employed and earning \$30 a week or more. Twenty-one of the 62 students in electrical and electronics technology earned \$50 or over per week, as compared with about 27 per cent of the students in the same income bracket studying industrial and mechanical technology.

Twenty-seven per cent of all of the students reporting full-time employment were earning in the \$50 and over category.

Counseling and Guidance

Counseling and guidance is usually considered one of the five main functions of the community college. The importance of this function has been emphasized in many of the responses to items on the questionnaire.

Occupational choice if made now. Table LXVIII provided an opportunity for the respondents to suggest what might have been their occupa-

TABLE LXVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE AVERAGE WEEKLY INCOME FROM EMPLOYMENT WHILE ATTENDING COMMUNITY JUNIOR COLLEGE

Average weekly income	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Less than $10	1	0	0	4	0	1	0	0	2	7	3	0	0	18	6
$10-$14	0	0	0	1	2	5	0	0	3	4	1	0	0	16	5
$15-$19	0	0	0	6	3	2	0	0	2	4	2	1	0	20	7
$20-$24	2	0	0	6	3	4	3	0	4	4	1	0	0	27	9
$25-$29	2	0	0	4	2	2	1	0	5	4	0	1	0	21	7
$30-$34	3	0	3	3	2	1	1	0	2	3	2	1	0	21	7
$35-$39	0	0	9	2	0	1	1	0	0	2	0	0	0	15	5
$40-$44	0	0	4	3	0	3	0	0	0	3	0	0	0	13	4
$45-$49	0	0	2	0	0	0	0	0	1	0	0	0	0	3	1
$50 and over	5	0	2	11	13	8	3	1	13	12	3	6	1	78	27
Not given	6	2	0	9	9	1	3	0	7	20	2	3	3	65	22
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

tional decision if made at the time of the study rather than during the school year 1958-59.

Thirty-nine per cent said they would select the same occupation. Ten per cent indicated they would select a trade, 15 per cent a profession, and 11 per cent would enter business. The appeal of agriculture as a life occupation is slight to this group since only 1 per cent would make this choice. While approximately the same per cent of the graduates as

TABLE LXVIII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE OCCUPATIONAL CHOICE THEY WOULD MAKE AT THE TIME OF THIS STUDY

Occupational choice - now	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Select the same one	5	24	26	14	10	17	8	8	114	39	38	33
Select a trade	1	9	13	2	0	2	1	1	29	10	5	17
Select a profession	0	11	16	3	4	6	3	2	45	15	23	51
Enter business	0	7	14	1	3	2	3	4	34	11	10	29
Enter agriculture	0	1	2	0	0	0	0	0	3	1	1	33
Other	1	3	0	1	1	7	1	2	25	8	5	20
None given	2	12	11	4	2	9	4	3	47	16	19	40
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

of the total respondents would have selected the same occupation if the choice were presently made, only about half as many of the graduates would have selected a trade and over 50 per cent more would have selected a profession.

How satisfied were the respondents with the occupational choice they had made? Table LXIX offers some answers to this question. Fifty-five per cent of the respondents who studied civil technology would select the same field now. Eight of the 14 respondents enrolled in metallurgical technology would again make the same choice. But, only about 1 of every 3 enrolled in automotive technology, drafting technology, industrial technology, or mechanical technology would select the same field today. The largest percentages of those who would select a profession were concentrated in the group of individuals who had chosen civil technology, drafting technology, and/or mechanical technology. Six of the 28 individuals enrolled in electronics technology indicated that they would have entered business.

<u>Assistance in arriving at an occupational choice</u>. The number of individuals in need of assistance in arriving at an occupational decision suggested the importance of this guidance and counseling function. The results of the tabulation of the responses pertaining to this point is given in Table LXX by colleges and in Table LXXI by programs.

In general, the students seemed well satisfied with the way the counseling function was being performed. On a numerical rating scale with 1 as the highest value and 5 as the lowest value, most of the respondents from the participating colleges rated this function, 2.

TABLE LXXI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE OCCUPATIONAL CHOICE THEY WOULD MAKE AT THE TIME OF THIS STUDY

Occupational choice - now	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Select the same one	7	0	11	17	14	11	5	0	14	22	8	4	1	114	39
Select a trade	4	0	0	6	3	2	0	0	1	10	2	1	0	29	10
Select a profession	0	1	4	9	4	4	1	0	5	0	1	6	1	45	15
Enter business	2	0	0	4	4	6	1	1	8	6	0	1	1	34	11
Enter agriculture	0	0	0	1	0	0	0	0	0	2	0	0	0	3	1
Other	3	0	2	2	2	2	2	0	4	7	1	0	0	25	8
Not given	3	1	3	10	7	3	3	0	7	7	2	0	1	47	16
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

nearly one-half of the graduates also rated this 2 with 10 per cent rating it 1.

The composite results indicated that 11 per cent considered the performance of this function to be excellent; whereas, only 4 per cent considered it to be very poor. Thirty-one per cent said that it was good and only 16 per cent stated that it was poor. Twenty-seven per cent rated the performance of the function as fair.

TABLE LXX

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN MAKING AN OCCUPATIONAL CHOICE

Quality of guidance	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Excellent	2	10	8	3	2	3	1	4	33	11	10	30
Good	3	20	28	5	5	19	6	7	93	31	42	45
Fair	1	16	23	11	8	9	6	5	81	28	24	30
Poor	2	12	15	5	1	5	5	2	47	16	11	23
Very poor	0	2	4	1	1	3	2	0	13	4	7	54
Not given	1	5	15	0	3	4	0	2	30	10	7	23
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean of student ratings	2	2	2	3	2	2	3	2				

TABLE LXIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN MAKING AN OCCUPATIONAL CHOICE

Quality of guidance	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Excellent	5	0	3	4	2	2	2	0	4	5	3	2	1	33	11
Good	4	0	10	14	14	5	1	1	14	19	7	2	2	93	31
Fair	6	1	2	16	5	7	3	0	13	20	3	4	1	81	28
Poor	2	0	0	11	4	12	3	0	5	8	0	2	0	47	16
Very poor	1	0	2	2	2	0	0	0	3	3	0	0	0	13	4
Not given	1	1	3	2	7	2	3	0	0	8	1	2	0	30	10
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Table LXXI provides an analysis of the reaction of individuals by programs to the assistance received in making an occupational choice. Fifty per cent of those who studied automotive technology gave the performance of this function a rating of good or excellent. The same is true of the students enrolled in civil technology, electrical technology, industrial technology, and metallurgical technology. The number of students who rated the performance of counseling poor or very poor was higher among the enrollees in industrial technology and mechanical technology than that of the group as a whole.

Assistance in becoming adjusted at college. The quality of the counseling and guidance in assisting the students to become well adjusted at college as rated by the respondents is reported in Table LXXII according to colleges attended and in Table LXXIII according to curricula followed.

According to Table LXXII the mean rating by the students of this function was 2 for each of the colleges with the exception of Institution 7 which received a rating of 3. The rating scale had 1 as the highest rating and 5 as the lowest rating on a five-point continuum.

Considering all respondents as one population, 11 per cent rated the performance of this function as excellent; 39 per cent, good; 29 per cent, fair; 9 per cent, poor; and only 3 per cent, very poor. A higher percentage of graduates checked ratings of excellent and good than of the total respondents.

How did the member respondents in the various curricula view the effectiveness of the colleges in this very important aspect? While 50 per cent of the total respondents gave a composite rating of excellent or good for this function, about 60 per cent of those from civil technology, industrial technology, and metallurgical technology rated this as good or excellent.

Twenty-two per cent of the students in drafting technology were unhappy with the way they were given assistance in adjusting to the college environment since they gave either a rating of poor or very poor to this item.

TABLE LXXII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN GETTING ADJUSTED AT COLLEGE

Quality of guidance	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Excellent	2	6	5	1	4	8	5	3	34	11	20	59
Good	3	25	32	11	8	19	9	8	115	39	44	38
Fair	2	21	29	6	3	14	6	5	86	29	28	33
Poor	0	8	10	5	2	0	0	2	27	9	2	7
Very poor	1	1	4	2	0	0	0	0	8	3	2	25
Not given	1	6	13	0	3	2	0	2	27	9	5	19
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean of student ratings	2	2	2	3	2	2	2	2				

TABLE LXXIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN GETTING ADJUSTED AT COLLEGE

Quality of guidance	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Excellent	3	1	3	2	3	3	2	1	6	4	2	3	1	34	11
Good	7	0	9	21	14	9	2	0	18	22	7	4	2	115	39
Fair	6	0	7	13	7	12	2	0	11	22	4	1	1	86	29
Poor	2	0	0	9	3	1	3	0	4	3	0	2	0	27	9
Very poor	0	0	0	2	1	0	0	0	0	5	0	0	0	8	3
Not given	1	1	1	2	6	3	3	0	0	7	1	2	0	27	9
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Counseling on school problems. A companion guidance function to facilitating adjustment to the college environment is assisting students in solving school problems. How did the students feel about the way the colleges served them in this area? As we study Tables LXXIV and LXXV student satisfaction is apparent.

In Table LXXIV, the figures indicate that 78 per cent rated the performance of this guidance function as excellent, good, or fair; while only 13 per cent rated it as poor or very poor. Approximately 88 per

TABLE LXXIV

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN COUNSELING ON SCHOOL PROBLEMS

Quality of guidance	2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Excellent	0	6	7	1	3	7	7	2	33	11	24	73
Good	4	22	36	9	12	17	6	7	113	39	44	39
Fair	4	24	22	7	1	12	5	8	83	28	21	25
Poor	0	9	8	4	0	5	0	2	28	9	6	21
Very poor	0	1	5	4	1	0	1	0	12	4	3	25
Not given	1	5	15	0	3	2	3	2	28	9	3	11
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean of student rating	2	2	2	3	2	2	2	2				

TABLE LXXV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN COUNSELING ON SCHOOL PROBLEMS

Quality of guidance	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Excellent	2	0	3	3	3	3	2	1	6	6	1	2	1	33	11
Good	9	0	8	16	16	9	4	0	17	19	8	6	1	113	39
Fair	4	1	4	19	5	10	3	0	11	21	3	1	1	83	28
Poor	3	0	4	6	3	2	1	0	1	5	1	1	1	28	9
Very poor	0	0	0	4	0	1	0	0	2	5	0	0	0	12	4
Not given	1	1	1	1	7	3	2	0	2	7	1	2	0	28	9
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

cent of those students who graduated rated this service as being fair, good, or excellent.

The analysis by programs in Table LXXV, show that over 20 per cent of the students in drafting technology were unhappy with the way this function was performed within the college.

While nearly 50 per cent of the group as a whole rated the performance of this function to be excellent or good, almost 60 per cent of the students in automotive technology and industrial technology gave it this rating. Only 1 of the 12 respondents in engineering technology gave the performance of this function a poor or very poor rating.

Counseling on personal problems. The general feeling of most students was that the community junior colleges were effective in providing good assistance in adjusting to college life and also in counseling on school problems. How did these students feel about the assistance in counseling on personal problems? The tabulation of this information is given by colleges in Table LXXVI and also summarized according to programs in Table LXXVII.

Comparison of Table LXXVI and Table LXXIV revealed that the mean rating, using the same five-point rating scale, of both tables is the same. While the mean ratings were identical, the evaluation by percentages shows a definite downward shift in the ratings of excellent, good, and fair. The distribution of student ratings by colleges more nearly approximates a normal distribution for this item than for the previous one with the exception of the ratings given the performance of the activity within Institution 9. Again, a large percentage of the graduates checked excellent and good than of the total respondents.

The high degree of student satisfaction of students from industrial technology and mechanical technology was apparent as a result of studying Table LXXVII. General satisfaction was also apparent among the respondents from automotive technology, civil technology, and electrical technology. However, the feeling of satisfaction was not shared to the same degree by 12 of the 49 respondents from drafting technology who gave this item a poor or a very poor rating.

TABLE LXXVI

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN COUNSELING ON PERSONAL PROBLEMS

Quality of guidance	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Excellent	1	2	3	2	1	5	3	2	19	6	9	47
Good	1	18	21	7	8	13	5	3	76	26	39	51
Fair	5	21	29	7	7	14	6	8	97	33	27	28
Poor	0	11	8	4	0	5	1	1	30	10	7	23
Very poor	1	2	7	4	1	0	2	1	18	6	6	33
Not given	1	13	25	1	3	6	3	5	57	19	13	23
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean of student ratings	2	2	2	3	2	2	2	2				

TABLE LXXVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING QUALITY OF GUIDANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN COUNSELING ON PERSONAL PROBLEMS

Quality of guidance	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Excellent	2	0	4	4	1	0	1	0	5	2	0	0	0	19	6
Good	6	0	6	11	14	4	0	1	10	11	7	4	2	76	26
Fair	5	1	3	15	5	13	5	0	16	26	3	4	1	97	33
Poor	2	0	3	7	5	3	1	0	2	4	2	1	0	30	10
Very poor	1	0	0	5	1	1	1	0	2	7	0	0	0	18	6
Not given	3	1	4	7	8	7	4	0	4	13	2	3	1	57	19
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Assistance in securing a job. An important outcome of industrial-technical education normally is achieved only upon securing employment. Did the respondents believe that they had received adequate assistance from the college in this task? The results of the tabulation of the opinions of the students are provided in Tables LXXVIII and LXXIX.

Employing the same five-point rating scale as previously indicated, the students' mean rating in four of the institutions was 3, while in

TABLE LXXVIII

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE QUALITY OF ASSISTANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN OBTAINING A JOB

Quality of guidance	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Excellent	0	4	4	0	2	11	2	3	26	9	14	54
Good	2	10	11	7	2	10	4	3	49	17	21	43
Fair	2	10	19	5	3	10	1	4	54	18	16	30
Poor	1	13	6	6	5	1	2	3	37	12	13	35
Very poor	3	19	14	4	4	3	10	3	60	20	30	50
Not given	1	11	39	3	4	8	1	4	71	24	7	10
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	
Mean of student ratings	3	3	2	3	3	2	4	2				

TABLE LXXIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE QUALITY OF ASSISTANCE RECEIVED FROM THE COMMUNITY JUNIOR COLLEGE IN OBTAINING A JOB

Quality of guidance	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Excellent	1	0	8	1	0	2	3	0	4	5	2	0	0	26	9
Good	3	0	6	8	5	1	3	1	5	9	6	2	0	49	17
Fair	2	1	2	11	4	9	0	0	5	15	2	3	0	54	18
Poor	3	0	0	10	3	5	1	0	5	6	1	2	1	37	12
Very poor	8	0	1	12	7	4	1	0	15	8	2	2	0	60	20
Not given	2	1	3	7	15	7	4	0	5	20	1	3	3	71	24
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

three other institutions it was 2 and in one institution it was 4. The downward trend is apparent also, from a study of the percentages listed in the table. The quality of assistance received from the colleges in obtaining a job were rated as follows: excellent, 9 per cent; good, 17 per cent; fair, 18 per cent; poor, 12 per cent; and very poor, 20 per cent. For the first time in the study of the major guidance functions 1 of every 5 students stated that these colleges were doing a very poor job in a guidance function. Approximately 30 per cent of the graduates agreed with the opinion of the total respondents in characterizing the assistance in obtaining a job as being very poor. The feeling of deficiency among the total number of respondents was especially strong in several of the institutions. Only respondents who had attended Institution 9, strongly persisted in the feeling that the colleges had done a good job in the performance of this function. Thirty-one of the 43 students who responded indicated excellent, good, or fair as the rating of the assistance received in securing employment.

Further study of this topic as presented in Table LXXIX suggested feelings of dissatisfaction in the programs of automotive technology, drafting technology, electrical technology, electronics technology, industrial technology, and mechanical technology.

Manner of securing the first job. The manner of securing the first job is the subject of Table LXXX and LXXXI.

Four of every 10 respondents as shown in Table LXXX secured the first job through their own efforts. Sixteen per cent stated that they secured the first job through friends and relatives, while only 8 per cent obtained the position through the college placement service efforts. Five per cent used an employment agency successfully for this purpose. Twenty per cent had the job when they enrolled. While approximately 36 per cent of the graduates secured their own positions, about 15 per cent were placed by the college placement services.

TABLE LXXX

NUMBER AND PERCENTAGE OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE MANNER OF SECURING THE FIRST JOB AFTER LEAVING THE COMMUNITY JUNIOR COLLEGE

Manner of securing first job	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
College placement service	1	8	4	0	0	4	2	4	23	8	16	70
Friends and relatives	1	13	12	7	6	3	3	2	47	16	11	23
My own efforts--letters, etc.	3	29	37	10	7	11	12	10	119	41	37	31
Employment agency	2	3	3	4	1	0	1	2	16	3	7	44
Had job before	1	5	28	2	4	17	2	1	60	20	18	30
Other	0	2	1	2	1	4	0	0	10	3	6	60
Not given	1	7	8	0	1	4	0	1	22	7	6	27
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE LXXXI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE MANNER OF SECURING THE FIRST JOB AFTER LEAVING THE COMMUNITY JUNIOR COLLEGE

Manner of securing first job	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
College placement service	2	0	2	4	2	0	1	0	2	4	6	0	0	23	8
Friends and relatives	2	1	0	8	3	8	6	0	8	8	0	2	1	47	16
My own efforts - ads, letters, etc.	11	1	1	23	10	10	2	1	17	34	4	4	1	119	41
Employment agency	1	0	0	5	1	0	1	0	3	4	1	0	0	16	5
Had job before	1	0	14	5	11	8	1	0	8	7	0	5	0	60	20
Other	1	0	2	1	0	2	0	0	1	1	1	0	1	10	3
Not given	1	0	1	3	7	0	1	0	0	5	2	1	1	22	7
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

The college placement service was most effective in placing individuals who studied metallurgical technology according to Table LXXXI. Six of these 14 individuals were placed by the institution. None of the students who studied architectural technology, electronics technology or industrial management technology obtained their positions this way. One-half of those enrolled in engineering technology secured their positions through the efforts of friends and relatives. Fourteen of the 20 students in civil technology had the job when they enrolled. This was also true of about one-third of those in electronics and electrical technology.

Relationship of high school quartile rank to college grade point average. The relationship between the quartile rank of the high school graduates and the grade point average earned in college by the same students has been tabulated in Table LXXXII for a select group, the respondents from Institution 6, as an indicator of the possible use that could be made of this kind of an instrument as a guidance tool. While 93 individuals from Institution 6 responded, the high school quartile average was not available for 30. The investigator secured from the registrar the grade point average of the respondents. After consideration of the use of correlation, the decision to employ a two-way table presenting all of the data was deemed more meaningful.

In order to understand this table it is important to remember that the order of quartile arrangement used designates 1 as the highest quartile and 4 as the lowest quartile. Also, the college grade point average is the students' honor point ratio resulting from all of the courses taken in the community junior college.

Only 1 student enrolled who ranked in the highest quartile in high school. He earned grades between C and B at the community junior college. On the other hand, 4 students who ranked in the second quartile in high school earned grades between B and A in college. No one ranking in the third and fourth quartiles in high school earned average grades higher than B in college. Twelve of the students were in the fourth quartile in high school. Only 1 of these 12 had average grades in college of C or better while 7 of the 12 had D averages in college and 4 of them had averages of less than D in college. Sixteen of the 26 students who were in the second quartile in high school, were successful in maintaining average grades of C or better in college.

TABLE LXXXII

NUMBER OF STUDENTS WITH THE RELATIONSHIP OF HIGH SCHOOL QUARTILE RANK TO COLLEGE GRADE POINT AVERAGE INDICATED IN PARTICIPATING COMMUNITY JUNIOR COLLEGE NUMBER 6

High school quartile rank	College grade point average				Not given	Total
	0.01-0.99	1.00-1.99	2.00-2.99	3.00-3.99		
1	0	0	1	0	0	1
2	2	8	12	4	0	26
3	2	10	6	0	1	19
4	4	7	1	0	5	17
Not given	2	7	14	1	6	30
Total	10	32	34	5	12	93

While students who are in the third or fourth quartiles in high school may be successful in industrial-technical curricula in the Michigan public community colleges, their chances of success, according to this indicator, is much less than those who ranked in the first and second quartile in high school.

Relationship of high school quartile rank to number of semester hours earned in college. Another indicator which may be a useful instrument in predicting the success of high school graduates in industrial-technical curricula, is the relationship between the student's high school quartile rank and the number of semester hours earned by the student in college. This relationship is indicated in Table LXXXIII for a selected group, Institution 6, as a means of exploring the possibility of utilizing this type of information for guidance and counseling. In this table also, the order of the quartile arrangement used designates 1 as the highest quartile and 4 as the lowest quartile.

Only 1 person who ranked in the fourth quartile in high school earned more than 40 semester hours in college; whereas, 2 students from the third quartile in high school earned 60 or more semester hours in college. Seven students who were in the second quartile earned 60 or more semester hours in college. The person who ranked in the first quartile in high school also earned 60 or more semester hours in college.

After consideration of the possibility of using correlations to show this relationship, the decision to use the two-way table was made in order to present the total data.

TABLE LXXXIII

NUMBER OF STUDENTS WITH THE RELATIONSHIP OF HIGH SCHOOL QUARTILE RANK TO THE NUMBER OF SEMESTER HOURS EARNED IN COLLEGE INDICATED IN PARTICIPATING COMMUNITY JUNIOR COLLEGE NUMBER 6

Semester hours earned in college	Quartile high school rank 1	2	3	4	Not given	Total
0-9	0	4	5	1	6	16
10-19	0	3	1	5	3	12
20-29	0	4	4	4	4	16
30-39	0	4	3	2	4	13
40-49	0	2	1	0	0	3
50-59	0	2	2	0	0	4
60-69	1	5	2	1	7	16
70-79	0	1	0	0	0	1
80-89	0	0	0	0	0	0
90-99	0	1	0	0	0	1
Not given	0	0	1	4	6	11
Total	1	26	19	17	30	93

This table does seem to indicate a definite relationship between the high school quartile rank and the number of credit hours earned by the students in college.

Relationship of high school quartile rank to the quartile rank of the student on the college entrance test. What is the relationship between the student's quartile rank in high school and the quartile rank on the college entrance examination? This answer is shown in Table LXXXIV.

Unfortunately, information was not available for several of the individuals involved. Also, none of the students taking the college entrance test placed in either the first or the fourth quartiles.

The one individual who ranked in the first quartile in high school, ranked in the second quartile on the entrance test. Ten of the 26 students who were in the second quartile in high school, ranked in the second quartile on this test; while 14 who were in the second quartile in high school were in the third quartile on the test. Nineteen individuals were in the third quartile in high school; but, in college, 4 of these students were in the second quartile, 14 in the third and no information

TABLE LXXXIV

NUMBER OF STUDENTS WITH THE RELATIONSHIP OF HIGH SCHOOL QUARTILE RANK TO THE QUARTILE RANK ON THE COLLEGE ENTRANCE TEST IN PARTICIPATING COMMUNITY JUNIOR COLLEGE NUMBER 6

High school quartile rank	Quartile rank on college entrance test					Total
	1	2	3	4	Not given	
1	0	1	0	0	0	1
2	0	10	14	0	2	26
3	0	4	14	0	1	19
4	0	3	12	0	2	17
Not given	0	2	21	0	7	30
Total	0	20	61	0	12	93

was available for the other students. The effect was even more pronounced as related to those students who ranked in the fourth quartile in high school. Two ranked in the second quartile on the entrance test and 12 were in the third quartile.

The two-way table indicates a trend in the relationships of the two factors being considered.

Relationship of the average grade earned in college to the number of semester hours earned in college. Another relationship which may be useful for guidance purposes and also as an aid in the identification of the characteristics of the industrial-technical student was the relationship between the average grade earned in college and the number of semester hours earned in college. This is shown in Table LXXXV.

The organization of the table follows the same plan as used in the three previous tables with the data obtained from the office of the registrar.

Is the old saying true in this instance, that nothing succeeds like success? That is, do the students who achieve the higher academic success continue in school and thus finish the larger number of semester hours?

Study of the table confirms this fact. No one earned over 29 semester hours who had a grade point average of less than 1.0; but, 2 students earned as many as 60 semester hours even though they had a grade point average of less than 2. Fifteen students earned over 60 semester hours who had a grade point average between 2.0 and 4.0.

This table suggests that several good students terminated their experience in the industrial-technical curricula without acquiring many semester hours. One student whose average grades were B or better earned 9 or fewer semester hours. Eleven students whose grade average was between C and B earned 9 or fewer semester hours.

Sixteen of the 39 students whose average grades were C or better earned 60 or more credits; while, only 2 of the 42 students whose grade

TABLE LXXXV

NUMBER OF STUDENTS WITH THE RELATIONSHIP OF THE AVERAGE GRADE EARNED IN COLLEGE IN PARTICIPATING COMMUNITY JUNIOR COLLEGE NUMBER 6

Semester hours earned in college	College grade point average					Total
	0.01-0.99	1.00-1.99	2.00-2.99	3.00-3.99	Not given	
0-9	2	1	11	1	1	16
10-19	5	7	0	0	0	12
20-29	3	8	4	1	0	16
30-39	0	13	0	0	0	13
40-49	0	1	1	1	0	3
50-59	0	0	4	0	0	4
60-69	0	2	12	2	0	16
70-79	0	0	1	0	0	1
80-89	0	0	0	0	0	0
90-99	0	0	1	0	0	1
Not given	0	0	0	0	11	11
Total	10	32	34	5	12	93

averages were less than C, earned 60 or more semester hours of credit.

Relationship of average grade earned in college to the quartile rank on the college entrance test. Table LXXXVI is devoted to presenting the relationship between the average grade earned in college and the quartile rank on the college entrance test.

The order of quartiles, sources of data, and organization of the table is the same as for the previous tables.

None of the students were ranked in the first or in the fourth quartile on the college entrance test. In addition, there was a lack of information concerning some of the individuals.

None of the students who ranked in the third quartile on the college entrance test, had an honor point ratio higher than 2.99; that is,

TABLE LXXXVI

NUMBER OF STUDENTS WITH THE RELATIONSHIP OF THE AVERAGE GRADE EARNED IN COLLEGE TO THE QUARTILE RANK ON THE COLLEGE ENTRANCE TEST IN PARTICIPATING COMMUNITY JUNIOR COLLEGE NUMBER 6

Quartile rank on college entrance test	College grade point average 0.01-1.99	1.00-1.99	2.00-2.99	3.00-3.99	Not given	Total
1	0	0	0	0	0	0
2	0	6	8	4	2	20
3	9	24	20	0	8	61
4	0	0	0	0	0	0
Not given	1	2	6	1	2	12
Total	10	32	34	5	12	93

they earned average grades of less than B. Twenty-four of these 61 students earned less than an average grade of C and 9 of them earned less than an average grade of D.

Analysis of those who placed in the second quartile on the college entrance test reveals that 4 of the 20 earned grades of B or better, 8 earned average grades of C or better, and 6 earned average grades of D or better. No one who placed in the second quartile had an average college grade of less than D.

<u>Relationship of the students' quartile rank on the college entrance test to the number of semester hours earned</u>. Utilizing the information on quartile rank on the entrance test and the number of semester hours earned in college the investigator sought to derive further characterization of the students in industrial-technical curricula. The results of the tabulation of this data is given in Table LXXXVII.

Since none of the students studied were in either the first or the fourth quartile on the college entrance test, the interpretations available from this table were somewhat limited.

While more than three times as many students were in quartile three as in quartile two, the number of students who were in quartile three that earned over 60 credits was less than twice as many as in quartile two. Even though there were some variations, the ratio between the number in quartile two and quartile three was close to the ratio of 3:1 on several of the steps. This fact would seem to justify the assumption that while there was some relationship between the two variables, it was not a consistent and dependable predictor of behavior for the data available.

Curriculum and Instruction

A determination of the effectiveness of the curriculum and the efficiency of the instruction was the next problem in the evaluation by the students who had pursued the community junior college educational

TABLE LXXXVII

NUMBER OF STUDENTS WITH THE RELATIONSHIP OF THE STUDENTS' QUARTILE RANK ON THE COLLEGE ENTRANCE TEST TO THE NUMBER OF SEMESTER HOURS EARNED IN COLLEGE IN PARTICIPATING COMMUNITY JUNIOR COLLEGE NUMBER 6

Semester hours earned in college	Quartile rank on college entrance test				Not given	Total
	1	2	3	4		
0-9	0	3	9	0	4	16
10-19	0	1	9	0	2	12
20-29	0	3	10	0	3	16
30-39	0	1	12	0	0	13
40-49	0	2	1	0	0	3
50-59	0	1	3	0	0	4
60-69	0	6	10	0	0	16
70-79	0	0	0	0	1	1
80-89	0	0	0	0	0	0
90-99	0	1	0	0	0	1
Not given	0	2	7	0	2	11
Total	0	20	61	0	12	93

program. With this purpose in mind the questionnaire contained items probing into the student opinions to ascertain their ideas on many curriculum matters: for example, which courses were helpful and which were not; which ones were geared to meet the needs of technicians and which ones were not; whether the program was too long or too short; too theoretical or too practical.

Courses the students indicated as very helpful. Devoted to the topic of courses that were deemed very helpful are Tables LXXXVIII and LXXXIX.

On the questionnaire the student was asked to check all the courses that were very helpful. In some cases only one course was checked while in other cases several were checked. The number of respondents commenting from each of the participating colleges is given in the next table, Table LXXXVIII, as well as the course areas at the left in the table. The row at the bottom gives the number of respondents from each of the colleges as a means of comparison.

The graduates identified as most helpful courses in descending order: drafting and design, technology, mathematics, and English.

In general, the industrial-technical students who responded felt that the most helpful areas in order of decreasing importance were: drafting and design, mathematics, electricity and electronics, English, and the technology subjects. The course areas that received the least number of votes as the most helpful were in order of ascending frequency: art, architecture, business, leadership training, and social science. The pattern of responses was quite consistent for respondents from all of

TABLE LXXXVIII

NUMBER OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE FOLLOWING COURSES AS VERY HELPFUL

Number of respondents in course areas	Institution 2	5	6	7	8	9	10	11	Total	Graduates No.	Per cent
Architecture	0	3	1	12	1	2	2	2	23	6	26
Art	0	1	0	2	1	0	1	1	6	2	33
Business	2	5	3	4	3	2	1	4	24	10	42
Drafting and design	9	42	53	18	15	33	16	10	196	80	41
Electricity	3	13	22	0	5	11	1	2	57	25	44
Engineering	4	16	8	11	5	19	9	3	75	41	55
English	8	32	26	7	9	32	8	13	135	57	42
Leadership training	2	3	6	1	8	7	6	9	42	27	64
Mathematics	8	33	43	19	12	32	14	10	171	62	36
Physical education	3	22	26	9	7	11	6	1	85	26	31
Physical science	6	12	16	9	9	10	6	1	69	33	48
Psychology	7	19	11	4	7	2	9	6	65	31	48
Social Science	2	18	8	3	3	8	3	0	45	23	51
Technology	7	34	28	10	11	21	13	5	129	65	50
Total number of respondents in 8 colleges	9	67	93	25	20	43	20	20	297	101	
Per cent	3	23	31	8	7	14	7	7		34	

TABLE LXXXIX

NUMBER OF RESPONDENTS BY PROGRAMS INDICATING THE FOLLOWING COURSES AS VERY HELPFUL

Number of respondents in course areas	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total
Architecture	1	1	2	12	0	0	1	0	3	3	0	0	0	23
Art	0	1	0	3	0	0	1	0	1	0	0	0	0	6
Business	6	0	2	4	1	1	0	1	3	6	0	0	0	24
Drafting and design	9	1	15	35	16	14	10	1	31	46	9	6	3	196
Electricity	10	0	5	5	24	16	1	0	5	14	1	3	0	84
Electronics	3	0	4	4	19	17	1	0	3	5	1	0	0	57
Engineering	3	1	14	17	4	3	5	1	11	12	3	1	0	75
English	10	0	17	27	8	14	6	1	17	19	7	7	2	138
Leadership training	6	0	4	3	3	2	2	1	11	8	0	1	1	42
Mathematics	10	1	14	34	20	18	6	1	23	34	4	4	2	171
Physical education	3	1	1	19	8	12	1	1	8	20	5	3	3	85
Physical science	2	1	5	18	4	5	3	1	12	12	2	3	1	69
Psychology	9	0	1	12	3	7	3	1	13	7	3	4	2	65
Social science	4	0	3	11	3	3	1	1	4	5	6	3	1	45
Technology	10	0	11	20	13	13	3	1	22	23	8	3	2	129

the participating colleges.

Analysis of this information according to programs is shown in Table LXXXIX. A study of this table suggests, for instance, that the students in automotive technology believed that the most helpful courses were: electricity, English, mathematics, and technology. English, drafting and design, engineering, and mathematics, in descending order were named as very helpful subjects for students in civil technology. In drafting technology, industrial technology, and in mechanical technology, in descending order, the subjects named as most helpful were: drafting and design, mathematics, English, and technology. Students who had been enrolled in programs such as electrical technology and electronics technology, indicated that electricity and electronics, mathematics, drafting and design, and technology, in descending order, were most helpful to them.

Courses not very helpful. A composite of student opinion as to the courses that were not very helpful is provided in Table XC and XCI.

The organization of this table is similar to Table LXXXVIII with the summary number and percentage of respondents from each college omitted.

Considering the views of the respondents from all of the colleges as a composite, physical education, social science, and English in descending order were named as the three subject areas not very useful for students following industrial-technical curricula. Differences of opinion existed among students at different colleges.

Similarly, students from various curricula areas differed. The respondents from the various curricula listed those course areas which were not helpful in descending order of helpfulness as follows: civil technology: social science and electricity; drafting technology: social

TABLE XC

NUMBER OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE FOLLOWING COURSES AS NOT VERY HELPFUL

Number of respondents in course areas	Institution 2	5	6	7	8	9	10	11	Total	Graduates No.	Graduates Per cent
Architecture	0	5	6	1	1	3	3	2	21	12	57
Art	1	8	5	6	5	4	3	4	36	20	56
Business	1	7	3	3	1	3	1	1	22	9	41
Drafting and design	0	2	11	0	0	2	0	2	17	4	24
Electricity	0	5	9	0	1	4	0	1	20	8	40
Electronics	0	3	2	0	1	3	1	1	11	5	45
Engineering	0	1	3	0	0	0	1	0	5	2	40
English	0	9	23	5	2	2	2	3	46	12	26
Leadership training	1	6	2	3	0	1	0	1	14	5	36
Mathematics	0	5	1	0	1	1	0	2	10	1	10
Physical education	2	19	21	8	4	6	6	2	68	30	44
Physical science	0	6	2	3	1	6	2	3	23	10	43
Psychology	0	11	5	4	0	3	2	3	28	13	46
Social science	2	19	8	7	6	12	6	4	64	30	47
Technology	1	1	3	1	0	2	0	2	10	0	00

TABLE XCI

NUMBER OF RESPONDENTS BY PROGRAMS INDICATING THE FOLLOWING COURSES AS NOT VERY HELPFUL

Number of respondents in course areas	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total
Architecture	2	0	1	2	2	7	1	0	3	1	2	0	0	21
Art	2	0	2	10	2	7	1	1	6	1	2	1	1	36
Business	0	0	2	8	2	5	0	0	2	1	2	0	0	22
Drafting and design	2	0	0	1	6	6	0	0	0	2	0	0	0	17
Electricity	2	0	4	2	1	1	0	0	1	7	1	1	0	20
Electronics	0	0	3	2	0	1	0	0	2	1	1	1	0	11
Engineering	0	0	0	0	1	1	0	0	1	1	0	1	0	5
English	2	0	0	9	12	2	2	0	4	14	0	1	0	46
Leadership training	1	0	0	7	1	2	0	0	1	1	0	1	0	14
Mathematics	1	0	0	1	1	2	2	0	1	0	1	1	0	10
Physical education	5	0	2	13	7	7	3	0	10	14	4	3	0	68
Physical science	3	0	3	5	0	6	1	0	2	3	0	0	0	23
Psychology	3	0	1	7	3	3	2	0	2	4	2	0	1	28
Social science	6	0	6	14	6	7	3	0	11	7	1	2	1	64
Technology	0	0	1	1	1	0	2	0	1	3	1	0	0	10

science, physical education and art; electrical technology: English and physical education; electronics technology: social science, physical education, art and architecture; industrial technology: social science and physical education; mechanical technology: English and physical education; metallurgical technology: physical education.

The graduates identified the following subjects as least helpful, listed in descending order: physical education, social science, art, English, and architecture.

Areas in which additional courses would have been helpful. The respondents were provided an opportunity to suggest which additional courses would have been helpful. Table XCII summarizes this information according to the colleges attended by the respondents, while Table XCIII tabulates the responses according to the program studied by the students.

More students indicated mathematics than any of the other subject-matter areas as the field in which more courses would have been helpful. The next three in descending order of student votes were leadership training, engineering, and electricity. A slightly different conclusion is arrived at by studying the course areas identified by the graduates in which additional courses would have been helpful. The graduates listed in descending order: mathematics, leadership training, psychology, engineering and English.

Table XCIII shows that the students studying automotive technology would have preferred more courses in technology and also in engineering, while those taking civil technology would have liked more courses in leadership training and physical education. Engineering and mathematics were at the top of the list of most desired additional courses for the students in drafting technology; whereas, the students studying engineering

TABLE XCII

NUMBER OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING AREAS IN WHICH ADDITIONAL COURSES WOULD HAVE BEEN HELPFUL

Number of respondents in course areas	Institution								Total	Graduates	
	2	5	6	7	8	9	10	11		No.	Per cent
Architecture	1	7	3	0	1	4	1	4	21	11	52
Art	0	4	2	0	1	3	0	2	12	5	42
Business	1	7	3	1	2	8	3	1	26	15	58
Drafting and design	0	6	9	5	1	1	1	4	27	8	30
Electricity	0	5	12	6	2	3	4	5	37	16	43
Electronics	0	7	8	4	2	8	2	3	34	14	41
Engineering	2	12	6	2	5	5	0	6	38	18	47
English	0	9	6	4	1	6	4	0	30	18	60
Leadership training	1	9	7	3	1	11	7	1	39	20	51
Mathematics	0	16	18	2	4	1	0	5	46	26	57
Physical education	0	3	1	1	0	5	2	3	15	9	60
Physical science	1	5	3	2	1	5	4	2	23	14	61
Psychology	1	8	3	3	3	8	4	3	33	20	61
Social science	1	4	1	1	2	5	2	4	20	9	45
Technology	0	9	7	2	0	2	2	4	26	14	54

TABLE XCIII

NUMBER OF RESPONDENTS BY PROGRAMS INDICATING AREAS IN WHICH ADDITIONAL COURSES WOULD HAVE BEEN HELPFUL

Number of respondents in course areas	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total
Architecture	2	0	3	6	0	1	2	0	2	2	1	1	1	21
Art	2	0	1	1	0	3	2	0	0	2	0	1	0	12
Business	1	1	3	3	1	6	0	0	5	1	1	3	1	26
Drafting and design	2	0	1	6	3	0	1	0	3	8	1	2	0	27
Electricity	2	1	1	6	6	1	2	0	5	10	1	0	2	37
Electronics	2	1	3	4	3	6	1	0	4	6	0	2	2	34
Engineering	4	0	1	8	1	9	2	0	5	2	3	2	1	38
English	3	1	1	4	2	5	1	0	3	7	2	0	1	30
Leadership training	0	1	6	4	2	5	3	0	8	7	2	1	0	39
Mathematics	3	0	0	7	7	3	1	0	4	11	7	2	1	46
Physical education	2	0	5	2	0	1	2	0	1	1	0	1	0	15
Physical science	2	0	2	3	1	3	1	0	4	4	1	1	1	23
Psychology	2	1	4	6	0	4	1	0	7	5	1	2	0	33
Social science	1	1	2	3	0	6	2	0	3	0	0	1	1	20
Technology	4	1	1	1	1	5	4	0	2	3	3	1	0	26

technology wanted more courses in technology, and in leadership training. While the respondents from programs of electrical technology wanted more mathematics and electricity; those in electronics wanted more engineering, business, electronics, and, perhaps surprisingly, more social science. The respondents from industrial technology desired more courses in leadership training and psychology; while, those from mechanical technology desired more mathematics and electricity. The enrollees who studied metallurgical technology believed they would have benefited by more courses in mathematics, technology, and engineering.

<u>Courses that need to be geared more to the needs of the technicians</u>. The purpose of this item of the questionnaire was to identify, from the students' point of view, courses or course areas where revision or modification of content or presentation would provide more practical education for students in industrial-technical curricula. This item is presented in Table XCIV according to colleges and in Table XCV according to the programs pursued.

English drew the largest number of responses as the course that needed to be geared more to the needs of technicians, the graduates also agreed on this subject.In descending order, mathematics was named second, with electronics third, while electricity and leadership training were tied for fourth position on the table.

Detailed analysis is provided in Table XCV of the reactions of those who studied in the various program areas. Automotive students listed drafting and design as the subject that needed to be geared more to meet their needs; while the students from the drafting technology curriculum listed art and technology as the ones that needed revision. English was listed as the subject most in need of being geared to the needs of the technicians by students from the programs of electrical

TABLE XCIV

NUMBER OF STUDENT RESPONDENTS FOR EACH COLLEGE INDICATING THE FOLLOWING COURSE AREAS AS NEEDING CHANGE TO BE GEARED MORE TO THE NEEDS OF THE TECHNICIANS

Number of respondents in course areas	Institution								Total	Graduates	
	2	5	6	7	8	8	10	11		No.	Per cent
Architecture	0	3	0	1	3	1	1	0	9	8	89
Art	0	3	0	4	0	0	1	1	9	6	67
Business	0	4	3	0	1	2	2	1	13	8	62
Drafting and design	0	8	2	1	2	3	2	0	18	6	33
Electricity	1	4	3	2	3	2	3	1	19	8	42
Electronics	1	3	3	2	3	4	3	1	20	11	55
Engineering	0	2	3	2	0	1	1	0	9	2	22
English	1	9	10	5	3	1	4	0	33	12	36
Leadership training	1	5	3	4	2	2	2	0	19	8	42
Mathematics	1	5	5	3	1	3	5	0	23	9	39
Physical education	0	3	0	0	0	1	0	2	6	3	50
Physical science	0	8	0	1	1	1	1	1	13	8	62
Psychology	0	2	2	0	2	0	2	0	8	4	50
Social Science	0	3	1	2	0	2	2	1	11	5	45
Technology	0	5	3	2	2	3	1	0	16	4	25

TABLE XCV

NUMBER OF RESPONDENTS BY PROGRAMS INDICATING THE FOLLOWING COURSE AREAS AS NEEDING CHANGE TO BE GEARED MORE TO THE NEEDS OF THE TECHNICIANS

Number of respondents in course areas	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total
Architecture	0	0	0	3	0	2	0	1	3	0	0	0	0	9
Art	0	0	0	5	0	0	0	0	2	2	0	0	0	9
Business	1	0	1	1	1	0	2	0	3	2	1	1	0	13
Drafting and design	3	0	2	4	3	3	0	0	2	0	1	0	0	18
Electricity	2	0	1	3	0	2	1	1	4	4	1	0	0	19
Electronics	1	0	2	3	1	2	1	1	4	4	1	0	0	20
Engineering	0	0	1	3	1	1	1	0	0	2	0	0	0	9
English	1	0	1	3	4	3	1	0	7	6	4	3	0	33
Leadership training	1	0	0	3	0	3	0	0	5	4	2	1	0	19
Mathematics	2	0	2	3	2	2	1	0	6	4	1	0	0	23
Physical education	0	0	0	1	0	1	0	0	2	1	1	0	0	6
Physical science	0	0	1	4	0	0	0	0	3	1	3	1	0	13
Psychology	0	0	0	1	0	2	0	0	4	1	0	0	0	8
Social science	0	0	1	2	1	0	0	0	3	1	3	0	0	11
Technology	1	0	2	5	2	0	0	0	3	3	0	0	0	16

technology, electronics technology, industrial technology, mechanical technology, and metallurgical technology. Mathematics was named second by students in industrial technology. Students from programs of mechanical technology cast the same number of votes for electricity, electronics, leadership training, and mathematics as the course areas second on the list as needing change for the technicians.

Were the college facilities and classroom activities conducive to studying and learning? The atmosphere for learning is involved in this item. The results are presented in two tables, Table XCVI for each of the participating colleges and Table XCVII for each of the curricula.

A glance at Table XCVI indicates that most students were firmly convinced that the community junior colleges offered a good environment

TABLE XCVI

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE COLLEGE FACILITIES AND CLASSROOM ACTIVITIES WERE CONDUCIVE TO STUDYING AND LEARNING

Response	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
Yes	6	55	81	19	17	39	16	10	243	83	85	35
No	1	4	2	4	1	1	3	6	22	7	7	32
Don't know	0	3	2	2	0	2	1	3	13	4	4	31
Not given	2	5	8	0	2	1	0	1	19	6	5	26
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7			34	

TABLE XCVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE COLLEGE FACILITIES AND CLASSROOM ACTIVITIES WERE CONDUCIVE TO STUDYING AND LEARNING

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	15	0	19	37	29	28	5	1	34	53	12	8	2	243	83
No	3	1	1	4	1	0	4	0	3	2	0	2	1	22	7
Don't know	0	1	0	3	0	0	2	0	1	3	1	1	1	13	4
Not given	1	0	0	5	4	0	1	0	1	5	1	1	0	19	6
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

in which to study, since 82 per cent responded positively. Only 7 per cent said the colleges did not provide a good environment for learning and 4 per cent did not know whether the environment was good or bad. The larger percentages of those whose responses were negative or uncertain were reflected by respondents who had attended several institutions. The collective opinion of the graduates was very similar to that of the total respondents.

Table XCVII presents the data as tabulated by programs. Nineteen of the 20 students in civil technology felt the educational environment was conducive to learning. The response was 100 per cent affirmative from those enrolled in electronics technology and industrial management technology. Only 1 of the 34 respondents in electrical technology indicated that the environment was not conducive to studying and learning. The largest number of "no's" was expressed by the enrollees in drafting technology, engineering technology, industrial technology, and automotive technology. Thirty-three per cent of the respondents in engineering technology were critical of the climate for learning. This was the highest percentage expressed by individuals in any of the programs affected by this study.

Courses too general or too specific. Are the courses offered to industrial-technical students in the public community junior colleges too general or too specific? The next four tables are devoted to this question. Tables XCVIII and XCIX deal with whether or not the majority of the courses were too general; whereas, in Table C and CI the reaction of the students was directed towards the issues of whether or not the majority of the courses was too specific.

The graduates agreed very closely with the expression of the total number of respondents on the issue of whether or not the majority of the courses were too general.

In response to the item on the questionnaire as to whether or not the majority of the courses was too general, 68 per cent responded negatively, as reported in Table XCVIII. Nineteen per cent of the respondents stated that they were too general and 8 per cent did not know.

The response by programs of the participants is given in Table XCIX. One of every 3 students in engineering technology said that the courses were too general. Approximately 20 per cent of the respondents who studied industrial technology and also who took metallurgical technol-

TABLE XCVIII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE MAJORITY OF COURSES WERE TOO GENERAL

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	1	16	11	6	4	6	5	8	57	19	20	35
No	5	43	64	16	14	34	15	10	201	68	72	36
Don't know	1	5	9	3	2	2	0	2	24	8	7	29
Not given	2	3	9	0	0	1	0	0	15	5	2	13
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE XCIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE MAJORITY OF COURSES WERE TOO GENERAL

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	3	1	3	11	4	6	4	0	11	9	4	0	1	57	19
No	13	0	17	30	21	20	7	1	24	45	9	12	2	201	68
Don't know	2	1	0	5	5	2	0	0	3	4	1	0	1	24	8
Not given	1	0	0	3	4	0	1	0	1	5	0	0	0	15	5
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

ogy felt that the courses were too general. Eighty-five per cent of the students in civil technology stated that the courses were not too general. Most of the students in the other programs shared this point of view.

Eighty-four per cent agreed that the majority of the courses were not too specific according to the information presented in Table C. Only 4 per cent said that the courses were too specific and another 7 per cent did not know.

A review of Table CI indicates that none of the individuals in the following curricula felt that the courses were too specific: automotive technology, architectural technology, civil technology, engineering technology, industrial management technology, and metallurgical technology. Three of the 34 respondents from electrical technology believed that the courses were too specific. This group was the largest that held this opinion.

TABLE C

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE MAJORITY OF COURSES WERE TOO SPECIFIC

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	0	2	6	1	1	0	1	1	12	4	3	25
No	7	58	70	22	17	38	19	18	249	84	93	37
Don't know	0	4	9	2	2	3	0	1	21	7	4	19
Not given	2	3	8	0	0	2	0	0	15	5	1	7
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE MAJORITY OF COURSES WERE TOO SPECIFIC

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	0	0	0	2	3	2	0	0	2	2	0	1	0	12	4
No	17	1	19	43	25	24	11	1	34	47	13	11	3	249	84
Don't know	1	1	0	1	3	2	0	0	2	9	1	0	1	21	7
Not given	1	0	1	3	3	0	1	0	1	5	0	0	0	15	5
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

<u>Curricula too short or too long</u>. Were the industrial-technical programs of the community junior colleges too short, too long, or just right? In order to obtain the viewpoint of students who had experienced the program, the question was inserted in the questionnaire. In Table CII and CIII respondents reacted to whether or not the program of study was too short; while in Tables CIV and CV their reaction was to whether or not the program of study was too long.

The tables follow the basic pattern established for the four previous ones, providing both total number of respondents and percentages of the totals as well as data, according to the colleges and with reference to the program in which they participated.

The opinions of the students are tabulated in Table CII in accordance with the college attended, to reflect their views on the question of

TABLE CII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE PROGRAM OF STUDY WAS TOO SHORT

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	1	14	20	6	7	12	12	8	80	27	44	55
No	6	42	56	14	11	28	7	8	172	58	50	29
Don't know	0	7	9	5	2	2	1	3	29	10	6	21
Not given	2	4	8	0	0	1	0	1	16	5	1	6
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE PROGRAM OF STUDY WAS TOO SHORT

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	8	1	5	7	9	8	3	0	22	12	2	2	1	80	27
No	9	0	15	30	20	15	6	1	14	40	10	10	2	172	58
Don't know	1	1	0	7	7	5	2	0	3	5	2	0	1	29	10
Not given	1	0	0	5	3	0	1	0	0	6	0	0	0	16	5
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

whether the program of study was too short or not too short. Considering the 297 individuals as the total population, 27 per cent believed the program was too short, 58 per cent did not, and 10 per cent indicated they did not know. However, 43 per cent of the graduates said the program was too short while 50 per cent said that it was not too short.

The fact that 12 of the 20 respondents from Institution 10 said that the course was too short is worthy of further study. It is apparent from Table CIII that the greatest support for the view that the total program of study was too short was among those enrolled in industrial technology and in automotive technology. Very strong proponents of the opinion that the total program of study was <u>not</u> too short were those who studied civil technology, electronics technology, and metallurgical technology.

The converse of the previous idea was expressed in the item on the questionnaire which sought the reactions of the respondents to the assumption that the program of study was too long. The results as summarized in Table CIV indicate that 80 per cent did not believe the program too long, 3 per cent did, while 9 per cent did not know. Among the graduates 92 per cent believed that the program was not too long and only 1 per cent thought it was too long.

The largest group within any one program that felt the program was too long was in mechanical technology, as shown in Table CV. Even within this group only 4 of the 63 respondents reported that the program of study was too long. Further study of the table will emphasize the fact that none of the students who had experienced the courses of eight of the curricula held the viewpoint that the program was too long.

Theory or practical applications. What should be the position of the Michigan public community junior colleges relative to the division of emphasis between theory and practical applications? Again, one of the sources of information worthy of some consideration is the opinion of the student. The next six tables are devoted to this theme. Is too much emphasis placed on theory and not enough on practical application? This is the subject of Tables CVI and CVII. A variation of the above statement was asked, is too much emphasis placed on practical applications and not enough on theory? Tables CVIII and CIX present this data. Next, the students' reaction was determined as to whether or not the amount of time devoted to developing hand or machine skills should be increased, and the findings are in Tables CX and CXI.

TABLE CIV

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE PROGRAM OF STUDY WAS TOO LONG

Response	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
Yes	0	2	3	0	1	1	0	1	8	3	1	13
No	7	52	73	21	17	36	16	15	239	80	92	38
Don't know	0	8	8	3	1	4	1	1	26	9	7	27
Not given	2	5	9	1	1	2	1	3	24	8	1	4
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE PROGRAM OF STUDY WAS TOO LONG

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	0	0	0	1	0	1	0	0	0	4	0	1	1	8	3
No	16	1	18	34	29	23	10	1	34	48	12	11	2	239	80
Don't know	1	1	1	7	2	3	0	0	2	6	2	0	1	26	9
Not given	2	0	1	7	3	1	2	0	3	5	0	0	0	24	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

The basic plan and pattern of organization has been continued in these tables as previously explained.

Table CVI provides information to substantiate the assumption that as a whole the industrial-technical students do not believe that too much emphasis is placed on theory. Fifty-five per cent said "No", while 31 per cent said "Yes", and 8 per cent did not know. Considerable variation, however, was expressed by respondents who had experienced the curricula of the eight institutions.

The strongest feeling of the students that too much emphasis was placed on theory and not enough on the practical applications was from the group that studied mechanical technology as shown in Table CVII. Students who enrolled in civil technology took a firm stand upholding the present emphasis, since 90 per cent stated that the emphasis was <u>not</u> too heavy on theory.

TABLE CVI

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING TOO MUCH EMPHASIS ON THEORY AND NOT ENOUGH ON PRACTICAL APPLICATION

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	2	21	36	10	7	6	4	5	91	31	22	24
No	3	38	40	13	11	32	16	13	166	55	73	44
Don't know	2	4	9	2	2	4	0	0	23	8	5	22
Not given	2	4	8	0	0	1	0	2	17	6	1	6
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING TOO MUCH EMPHASIS ON THEORY AND NOT ENOUGH ON PRACTICAL APPLICATION

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	5	1	1	14	13	8	3	1	10	26	4	4	1	91	31
No	11	0	18	26	16	18	7	0	26	26	8	7	3	166	55
Don't know	0	1	1	5	2	2	1	0	2	6	2	1	0	23	8
Not given	3	0	0	4	3	0	1	0	1	5	0	0	0	17	6
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Table CVIII presents an analysis according to colleges of the opinion of the respondents as to whether or not too much emphasis was placed on practical applications and not enough on theory. The response of the total population was: yes, 8 per cent; no, 77 per cent; and don't know, 6 per cent with 9 per cent failing to check the item.

Table CIX reflects the viewpoint of the students according to the programs on this same item. Approximately 15 per cent of the respondents who studied civil technology, electronics technology, and metallurgical technology felt that too much emphasis was placed on practical applications. It is hard to understand, however, that approximately 15 per cent of the students who had studied automotive technology also shared this point of view.

TABLE CVIII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING TOO MUCH EMPHASIS ON PRACTICAL APPLICATIONS AND NOT ENOUGH ON THEORY

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	0	7	5	1	1	5	1	4	24	8	13	54
No	5	47	70	22	15	34	19	15	227	77	81	36
Don't know	2	5	8	1	1	2	0	0	19	6	3	16
Not given	2	8	10	1	3	2	0	1	27	9	4	15
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING TOO MUCH EMPHASIS ON PRACTICAL APPLICATIONS AND NOT ENOUGH ON THEORY

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	3	0	3	2	3	4	1	0	2	3	3	0	0	24	8
No	13	1	16	36	25	22	10	1	33	48	9	10	3	227	77
Don't know	0	1	0	4	2	2	0	0	1	5	2	1	1	19	6
Not given	3	0	1	7	4	0	1	0	3	7	0	1	0	27	9
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

That the issue of whether the amount of time devoted to the development of hand or machine skills should be increased is controversial as supported by the weight of student opinion in Table CX. While the division of opinion is rather close, 43 per cent said the amount of time should be increased for this purpose; 36 per cent said it should not be increased; and 12 per cent did not know. The percentage of graduates who felt that the amount of hand or machine work should be increased was approximately the same as the total respondents. However, nearly 10 per cent more of the graduates believed that the amount of hand or machine work should not be increased as compared with the total group.

In some fields of work, hand and machine skills are more essential than in others. This is also true of the technologies. Table CXI supports this contention. Approximately one-half or more of the students

TABLE CX

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE AMOUNT OF TIME DEVOTED TO DEVELOPING HAND OR MACHINE SKILLS SHOULD BE INCREASED

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	3	28	48	12	8	9	11	10	129	44	42	33
No	3	23	21	10	8	26	8	8	107	38	47	44
Don't know	1	10	12	3	3	6	1	1	37	12	8	22
Not given	2	6	12	0	1	2	0	1	24	8	4	17
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE AMOUNT OF TIME DEVOTED TO DEVELOPING HAND OR MACHINE SKILLS SHOULD BE INCREASED

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	9	0	3	21	18	12	3	1	22	30	4	6	0	129	44
No	7	1	14	16	8	11	6	0	13	19	8	0	4	107	36
Don't know	1	0	2	8	3	5	2	0	3	7	1	5	0	37	12
Not given	2	1	1	4	5	0	1	0	1	7	1	1	0	24	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

felt that more emphasis needed to be given to the development of hand and machine skills in the curricula of automotive technology, electrical technology, industrial technology, and mechanical technology. Students who studied civil technology, engineering technology, and metallurgical technology seemed to place less emphasis on the need for devoting more time to the development of hand or machine skills than those in some of the other programs.

Plans for more course work. Do the students plan to take more courses? Fifty-three per cent of the students expressed a desire to take more courses in the technical field or in related subjects as shown in Table CXII. Sixty-eight per cent of the graduates indicated they desired additional courses. Only 14 per cent of the total respondents stated

TABLE CXII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING AN INTENTION OF TAKING MORE COLLEGE COURSES IN TECHNICAL OR RELATED SUBJECTS

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Per cent
Yes	6	37	42	15	12	28	10	6	156	53	68	44
No	1	5	16	3	3	6	2	6	42	14	10	24
Don't know	2	20	29	7	5	7	8	6	86	29	23	27
Not given	0	5	6	0	0	2	0	0	13	4	0	00
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING AN INTENTION OF TAKING MORE COLLEGE COURSES - TECHNICAL OR RELATED SUBJECTS

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	10	1	15	26	14	17	6	0	18	33	6	9	1	156	53
No	3	0	1	6	6	3	3	1	3	13	0	2	1	42	14
Don't know	3	1	4	17	11	7	2	0	18	14	6	1	2	86	29
Not given	3	0	0	0	3	1	1	0	0	3	2	0	0	13	4
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

that they did not plan to take more such courses and 29 per cent were uncertain. The uncertain plans of a large number of students is reflected in the responses to this item.

The continued quest for education is suggested by the fact that in Table CXIII three-fourths of those who studied civil technology planned to take more course work. While 6 of the 14 respondents from metallurgical technology were interested in taking more courses in this field, 6 were uncertain. None of these individuals indicated that they were not planning to take more courses in industrial-technical subjects.

Experiences of Those Who Terminated

The community junior college for many students is the final experience with formal education. That is why it is often called terminal education. Some students drop out without completing the requirements for the degree or certificate. Why did these people terminate? Some students accepted apprenticeships in various fields. What fields of apprenticeship did they enter? Others terminated their education at the community junior college and transferred to other colleges. What colleges did they transfer to? These are some of the many facts the investigator desired to ascertain of those students who terminated without graduation.

Reasons for not graduating. While many students did not divulge the reasons for not graduating, enough of the 297 respondents did, to provide some insight into this problem. Tables CXIV and CXV present the reasons given by the students for not graduating.

As shown in Table CXIV, four years after the initial enrollment, 8 per cent were still attending the community junior college. Seven per cent had transferred to another college while 5 per cent had accepted an apprenticeship. Another 7 per cent had entered the military service. But the largest group, consisting of 19 per cent of the total, either had accepted a new job or continued on a job previously held. However, 40 per cent of the respondents did not indicate the reasons for termination, while 13 per cent had other reasons, not listed above.

Examination of the data of Table CXV reveals that most of the

TABLE CXIV

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THE REASONS FOR NOT GRADUATING

Reasons	Institution								Total	Per
	2	5	6	7	8	9	10	11		cent
Attending same college	1	9	8	0	2	3	0	1	24	8
Attending other college	0	8	2	2	0	6	0	2	20	7
Accepted apprenticeship	0	1	8	4	0	3	0	0	16	5
In military service	0	6	12	1	1	1	0	1	22	7
Accepted or continued on a job	4	8	26	7	3	3	3	3	57	19
Other	1	6	14	7	4	4	1	1	38	13
Not given	3	29	23	4	10	23	16	12	120	41
Total	9	67	93	25	20	43	20	20	297	100
Per cent	3	23	31	8	7	14	7	7		100

TABLE CXV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE REASONS FOR NOT GRADUATING

Reasons	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Attending same college	0	0	0	5	4	3	1	0	1	5	3	1	1	24	8
Attending other college	1	1	2	4	1	2	2	0	0	3	0	3	1	20	7
Accepted apprenticeship	0	1	1	1	0	2	0	0	0	11	0	0	0	16	5
In military service	0	0	0	3	2	4	0	0	2	9	1	0	1	22	7
Accepted or continued on job	3	0	1	12	8	4	3	0	9	12	2	3	0	57	19
Other	1	0	2	10	6	6	1	0	4	6	0	1	1	38	13
Not given	14	0	14	14	13	7	5	1	23	17	8	4	0	120	41
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

students continuing in the community junior college after four years were studying courses in drafting technology, electrical technology, or metallurgical technology. Four of those who transferred to another college were students from drafting technology and 3 were from metallurgical technology. Twice as many students accepted an apprenticeship who were enrolled in mechanical technology as those in all the rest of the program combined. Nearly one-half of those who entered the military service were students from mechanical technology. About 25 per cent of those who accepted a job or continued on a job previously held, were enrollees from drafting technology, electrical technology, or industrial technology.

Transfers to other colleges. Further information concerning the students who continued their education by transferring to another college is shown in Table CXVI. Michigan State University and Western Michigan University each received 6 transfer students from the industrial-technical curricula of the community junior colleges. Seven of the 9 colleges or universities the students transferred to were located in Michigan.

Accepted apprenticeships. As previously mentioned most of those who accepted apprenticeships were from the mechanical technology program. Ten of the 18 students entering apprenticeships selected tool and die work or a machine shop related occupation. Eight of the students became apprentices in seven different skilled trades as shown in Table CXVII.

Other reasons for termination. While over one-half of the respondents preferred to omit this item of the questionnaire, those who did respond helped to provide some insight into this problem. The results of the responses have been recorded in Tables CXIX and CXX.

Table CXVIII indicates that the six reasons given most frequently with the percentages listed were: occupational goal uncertain, 7 per cent; financial, 6 per cent; personal, 6 per cent; low grades, 6 per cent; and, courses too general, 3 per cent. Low grades and uncertainty of the occupational goal were frequently mentioned by "drop outs' from Institution 6.

The most significant reasons according to the programs studied are given in Table CXIX. The reason listed most frequently for each of the

TABLE CXVI

NUMBER OF RESPONDENTS THAT INDICATED TRANSFERRING TO THE FOLLOWING COLLEGES OR UNIVERSITIES

Number of students	Institution	Address
6	Michigan State University	East Lansing, Michigan
6	Western Michigan University	Kalamazoo, Michigan
2	Central Michigan University	Mount Pleasant, Michigan
1	Wayne State University	Detroit, Michigan
1	Michigan College of Mining and Technology	Houghton, Michigan
1	University of Louisville	Louisville, Kentucky
1	Cedarville College	Cedarville, Iowa
1	Ferris Institute	Big Rapids, Michigan
1	Detroit School of Announcing	Detroit, Michigan

following curricula was: automotive technology, personal and high tuition; civil technology, financial; electrical and electronic technology, low grades; industrial technology, personal, and low grades; mechanical technology, occupational goal uncertain; metallurgical technology, personal, and also high tuition. The number of respondents checking each reason was very small in each of the above curricula.

TABLE CXVII

NUMBER OF RESPONDENTS INDICATING ACCEPTANCE OF AN APPRENTICESHIP IN THE FIELDS GIVEN

Number of students	Field of apprenticeship
4	Tool and die maker
3	Tool maker
2	Die maker
2	Pattern maker
1	Jeweler
1	Appliance serviceman
1	Pipefitter
1	Printer
1	Millwright
1	Model maker
1	Carpenter

TABLE CXVIII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THE REASONS FOR TERMINATION WITHOUT GRADUATING

Reasons	Institution 2	5	6	7	8	9	10	11	Total	Per cent
Financial	1	3	7	2	1	2	0	1	17	6
High tuition	0	3	0	0	0	0	0	0	3	1
Personal	0	4	8	3	0	1	2	0	18	6
Occupational goal uncertain	0	5	10	3	2	1	0	1	22	7
Family	0	1	2	1	0	0	0	0	4	1
Low grades	1	1	13	1	0	1	0	1	18	6
Courses too general	0	1	5	2	0	1	0	1	10	3
Courses too "deep"	0	0	1	1	0	0	0	0	2	1
Learned what I wanted	0	1	2	0	0	0	1	0	4	1
Attending another college	0	5	1	1	0	5	0	1	13	4
Other	2	6	9	5	2	4	1	2	31	11
Not given	5	37	35	6	15	28	16	13	155	53
Total	9	67	93	25	20	43	20	20	297	100
Per cent	3	23	31	8	7	14	7	7		100

Employment Experiences

Information was sought from the respondents relative to the number who had full-time jobs, the type of jobs held, the location of the

TABLE CXIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THE REASONS FOR TERMINATION WITHOUT GRADUATING

Reasons	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Financial	0	0	0	6	4	2	0	0	1	4	0	0	0	17	6
High tuition	2	0	0	0	0	0	0	0	0	0	1	0	0	3	1
Personal	2	0	0	1	3	2	1	0	2	6	1	0	0	18	6
Occupational goal uncertain	0	0	0	5	2	2	2	0	1	9	0	1	0	22	7
Family	0	0	0	2	0	0	0	0	1	1	0	0	0	4	1
Low grades	0	0	0	4	5	3	0	0	2	4	0	0	0	18	6
Courses too general	0	0	1	1	0	2	1	0	1	4	0	0	0	10	3
Courses too "deep"	0	0	0	1	1	0	0	0	0	0	0	0	0	2	1
Learned what I wanted	0	0	0	0	0	0	1	0	1	0	1	1	0	4	1
Attending another college	1	0	0	2	0	2	1	0	0	4	0	2	1	13	4
Other	1	0	3	7	3	2	1	0	5	5	1	2	1	31	11
Not given	13	2	16	20	16	13	5	1	25	26	10	6	2	155	53
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

positions in relation to the colleges attended, the level of wages, whether or not a very large per cent of these people had experienced unemployment, and similar data. The opinions of the respondents concerning the contribution of the community junior college education to job success were deemed valuable for this study.

Present employment status. What was the per cent of respondents who were employed or unemployed? Tables CXX and CXXI indicate that 78 per cent of the respondents were employed on full-time jobs, as employees of others, while 6 per cent were part-time employees working for others.

TABLE CXX

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE ACCORDING TO PRESENT STATUS OF EMPLOYMENT

Present status	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Employed by others full-time	8	46	77	21	16	30	16	17	231	78	77	33
Employed by others part-time	0	7	3	0	2	4	2	0	18	6	6	33
Self employed	1	1	1	0	1	1	0	1	6	2	2	33
Unemployed	0	5	5	4	1	5	1	1	22	7	14	64
Not given	0	8	7	0	0	3	1	1	20	7	2	10
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO PRESENT STATUS OF EMPLOYMENT

Present status	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Employed by others full-time	15	1	15	36	29	25	9	0	33	45	12	8	3	231	78
Employed by others part-time	0	0	1	2	0	2	1	0	4	4	1	3	0	18	6
Self employed	1	0	0	0	0	0	1	1	0	3	0	0	0	6	2
Unemployed	0	1	2	7	2	1	0	0	1	7	0	1	0	22	7
Not given	3	0	2	4	3	0	1	0	1	4	1	0	1	20	7
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Two per cent were self-employed and 7 per cent were unemployed. Another 7 per cent did not indicate their employment status. This total of 86 per cent were employed on a full or a part-time job.

Table CXXI provides information which shows that the number of unemployed were mainly among those who had taken drafting technology and mechanical technology. None of the students who had enrolled in automotive technology, engineering technology, industrial management technology, or metallurgical were unemployed. Only one person from electronics technology and one person from industrial technology were unemployed. Three of the 6 individuals who were self-employed had studied mechanical technology while the others were single representatives of automotive technology, engineering technology, and industrial management technology.

Present type of employment. Twelve classifications are utilized to provide an analysis of the job classifications of the respondents. This analysis is shown in Table CXXII.

The largest group of the respondents, 24 per cent, were employed at a job which they considered as a technician's job. Further analysis is provided by a list of the jobs which the respondents considered technicians' jobs in Table CXXIV. The second largest group, 15 per cent, reported employment on skilled jobs. The third category, unskilled workers, constituted 10 per cent of the respondents. Eight per cent were employed at semiskilled jobs. Only 3 per cent were employed at service jobs and 7 per cent in a professional capacity. Two per cent had secured positions as foremen or "firstline" supervisors and another 2 per cent had gained positions on a type of "middle-management" job. While only 1

TABLE CXXII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE ACCORDING TO PRESENT TYPE OF EMPLOYMENT

Present employment	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Technician job	3	20	14	5	4	18	5	2	71	24	40	56
Unskilled labor	1	9	9	2	3	3	0	3	30	10	10	33
Semiskilled job	0	6	12	1	2	1	1	1	24	8	1	4
Skilled job	1	11	19	5	2	1	5	2	46	15	11	24
Clerical or sales job	2	7	11	2	2	2	0	1	27	9	5	19
Service job	0	2	1	0	0	2	1	2	8	3	4	50
Farmer or farm worker	0	0	1	0	1	0	0	0	2	1	0	00
Professional worker	0	1	5	4	1	5	4	1	21	7	6	29
Foreman or "firstline" supervisor	1	0	1	0	1	1	1	0	5	2	3	60
"middle-management" job	0	1	1	1	1	1	0	0	5	2	4	80
Other	1	5	9	4	2	4	1	6	32	10	9	28
Not given	0	5	10	1	1	5	2	2	26	9	8	31
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

per cent was employed in agriculture, 9 per cent worked at clerical or sales jobs which was a larger percentage than was employed on semi-skilled jobs.

Sixty per cent of those who studied civil technology considered themselves employed on a technician's job according to the data shown in Table CXXIII. Even a higher per cent, 66 per cent, of the respondents from metallurgical technology were employed on technicians' jobs. Ten of the 28 who studied electronics technology were working on technicians' jobs.

The largest percentage of those employed on unskilled jobs had studied drafting or industrial technology. Approximately 1 out of 28 individuals who studied electronics technology was also working on technicians' jobs.

The largest percentage of those employed on unskilled jobs had studied drafting or industrial technology. Approximately 1 out of 6 of those who enrolled in electrical technology ended up at a semiskilled job. One of every 4 who studied mechanical technology was a skilled worker, and nearly 1 in 5 who studied automotive technology or industrial technology was in the skilled job classification at the time of the study. Those who were working on service jobs had studied automotive technology, electronics technology, industrial technology, or mechanical technology.

The preparation of the largest number of those who considered themselves employed in a profession was through industrial technology.

Nine individuals from electronics technology, industrial technology and mechanical technology assumed positions in supervision and management.

TABLE CXXIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO PRESENT TYPE OF EMPLOYMENT

Present employment	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Technician job	2	0	12	11	6	10	2	0	7	6	9	4	2	71	24
Unskilled job	1	0	1	10	3	1	2	0	6	4	1	1	0	30	10
Semiskilled job	2	0	0	2	5	3	1	0	2	6	3	0	0	24	8
Skilled job	4	1	0	6	4	2	1	0	8	16	0	4	0	46	15
Clerical or sales job	3	0	0	6	6	4	0	1	1	5	0	0	1	27	9
Service job	2	0	0	0	0	2	0	0	1	2	0	1	0	8	3
Farmer or farm worker	0	0	0	0	0	0	0	0	1	1	0	0	0	2	1
Professional worker	2	0	3	4	2	1	0	0	5	3	0	1	0	21	7
Foreman or "first-line" supervisor	0	0	0	0	0	1	0	0	2	2	0	0	0	5	2
"Middle-management" position	0	0	0	1	0	1	0	0	1	2	0	0	0	5	2
Other	1	1	2	4	2	2	5	0	3	10	1	1	0	32	10
Not given	2	0	2	5	6	1	1	0	2	6	0	0	1	26	9
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

The background of those who had accepted positions in clerical or sales work was quite varied but the largest percentage had enrolled in automotive technology.

Forty-nine different jobs were listed by the respondents as jobs they considered technicians' jobs as shown in Table CXXIV. Fourteen of these were in the draftsman-detailer family of jobs. Six were jobs as metallurgical technicians, 3 as electronics technicians, and 3 as laboratory technicians. Several technicians were employed on jobs related to highway construction and maintenance work.

Two students stated that they were working on jobs as engineering technicians.

In a large number of situations only 1 person was employed at the specific job title. The titles are those supplied by the respondents and may as a result vary from those used by the employers or those that might be listed by a standard reference source in this field.

The code number of the institution listed in the table on the right side provides identification with the participating institutions for the benefit of the reader.

While most of the titles which are listed were either related to the electrical or the mechanical field, a few like dental technician, fireman, and packaging engineer seem far removed from either the electrical or the mechanical fields. Several of the technicians' jobs also, were related to metallurgy.

Even though graduates constituted only 34 per cent of the respondents, approximately 40 per cent of the employed technicians were graduates

TABLE CXXIV

NUMBER OF RESPONDENTS INDICATING EMPLOYMENT IN JOBS THEY CONSIDERED TECHNICIANS' JOBS

Number of students	Title of job	Institution attended by each student
14	Draftsmen-detailer	3-5-5-7-7-8-8-8-9-9-9-9-11-9
6	Metallurgical technician	5-5-5-5-5-11
3	Electronics technician	5-5-6
3	Laboratory technician	6-5-8
3	Instrument Man I	9-9-9
2	Highway traffic technician	9-9
2	Highway laboratory technician	9-9
2	Engineering technician	9-10
1	Automotive repairman	6
1	Engineering assistant	2
1	Technical researcher	2
1	Draftsman conveyor engineer	2
1	Maintenance technician	3
1	Research technician	5
1	Heat treat technician	5
1	Electronics service technician	5
1	Quality control inspector	5
1	Automotive researcher	5
1	Assistant analysist	5
1	Customer engineer	5

TABLE CXXIV (continued)

Number of students	Title of job	Institution attended by each student
1	Ground equipment technician	5
1	Analytical research technician	5
1	Special metals inspector	5
1	Electronics testing inspector	5
1	Appliance service technician	6
1	Dental technician	6
1	Radar specialist	6
1	System engineer	6
1	Laboratory tester	6
1	IBM control operator	6
1	Machine repair machinist	6
1	Welder repairman	6
1	Machinist technician	6
1	Packaging engineer	7
1	Junior engineer	7
1	Engineering aide I	7
1	Fireman	7
1	Trouble shooter	9
1	Property technician B	7
1	Electrical model maker	8
1	Computer technician	9

TABLE CXXIV (continued)

Number of students	Title of job	Institution attended by each student
1	Radio and radar maintenance technician	9
1	Audio-visual repairman	9
1	Radio repairman	9
1	Cartographer and compilation aide	10
1	Quality control technician	10
1	Specialized vehicle development technician	10
1	Industrial radiographer	10
1	Materials handling technician	5

at the time of the study. However, 10 per cent of the graduates were employed on jobs as unskilled labor. This is exactly the same per cent as of the total respondents. The percentage of graduates employed on the following types of jobs was somewhat smaller than of the total respondents: semiskilled jobs, skilled jobs, clerical or sales job, farmers or farm workers, and professional workers.

Location of employment relative to college attended. The next three tables are designed to provide information as to the location of the respondents' employment relative to the site of the college attended.

In Table CXXV the statistics indicate that 77 per cent were

were employed within Michigan, only 6 per cent were employed in other states, while 16 per cent either failed to indicate location of employment or checked "other" on the item of the questionnaire. Nearly one-half of the individuals, 48 per cent to be exact, were employed in the

TABLE CXXV

NUMBER AND PERCENTAGE OF RESPONDENTS FROM EACH COLLEGE ACCORDING TO LOCATION OF PRESENT EMPLOYMENT RELATIVE TO COMMUNITY JUNIOR COLLEGE ATTENDED

Present employment location	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
In same community as college	6	10	53	19	17	21	9	9	144	49	47	33
Other community but within 50 miles	1	38	16	2	1	6	2	5	71	24	25	35
Other Michigan community but more than 50 miles	1	5	1	1	0	5	2	1	16	5	7	44
State other than Michigan	0	3	8	0	0	2	2	2	17	6	7	41
Other	1	2	4	2	1	2	4	1	17	6	5	29
Not given	0	9	11	1	1	7	1	2	32	10	10	31
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

same community in which the community junior college attended was located. Analysis of the table suggests very little difference in this respect between the graduates and the body of total respondents as far as the location of employment relative to college attended is concerned.

Thirteen of the 14 who enrolled in metallurgical technology were employed in Michigan according to Table CXXVI, 11 of them within a radius of 50 miles of the college attended. Ten of the 20 students in civil technology were employed within 50 miles of the college attended and 5 more within the state beyond the 50 mile radius. About two-thirds of the enrollees in electrical technology were employed in the same community as the college attended.

Seventeen individuals composing 6 per cent of the respondents were employed in states other than Michigan. Eight of these were students who had enrolled either in electrical technology or in electronics technology. Three from mechanical technology, and 2 each from industrial technology and automotive technology were employed in states other than Michigan. California attracted 4 students (See Table CXXVII.) the largest number employed in a state other than Michigan. Two students listed the following states as their present home: Illinois, Missouri, Nevada, and Florida. Ten other states made up the list of other states in which the respondents were employed.

Income on first job after college. The income on the first job after leaving college is the subject of the data of Tables CXXVIII and CXXIX.

The first job after college provided a compensation of \$ 75 to \$89

TABLE CXXVI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS ACCORDING TO LOCATION OF PRESENT EMPLOYMENT RELATIVE TO COMMUNITY JUNIOR COLLEGE ATTENDED

Present employment location	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
In same community as college	8	0	8	22	21	12	4	0	25	36	1	7	0	144	43
Other community but within 50 miles	6	1	2	16	2	8	4	1	4	13	10	3	1	71	24
Other Michigan community but more than 50 miles	1	0	5	1	0	2	1	0	3	0	2	1	0	16	5
State other than Michigan	2	0	1	0	4	4	1	0	2	3	0	0	0	17	6
Other	0	1	1	3	1	1	1	0	3	4	0	0	2	17	6
Not given	2	0	3	7	6	1	1	0	2	7	1	1	1	32	10
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

inclusively for the largest group, 21 per cent of the respondents. Nineteen per cent of the total earned less than $60 a week and only 1 per cent earned more than $180 a week on the first job after termination of college. The median salary for the total group was approximately $87 per

TABLE CXXVII

NUMBER OF RESPONDENTS INDICATING EMPLOYMENT IN STATES OTHER THAN MICHIGAN

Number of students	State
4	California
2	Illinois
2	Missouri
2	Nevada
2	Florida
1	West Virginia
1	Texas
1	Wisconsin
1	North Carolina
1	New York
1	Colorado
1	Ohio
1	Washington
1	Arkansas
1	Tennessee

week on the first job after college. Seven per cent of the respondents indicated earnings per week of $120 or over.

An idea of the potential earning capacity of the first job of the individuals who pursued the various curricula is possible by studying Table CXXIX.

TABLE CXXVIII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING AVERAGE WEEKLY INCOME FROM EMPLOYMENT ON FIRST JOB AFTER COLLEGE

Average weekly income	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
Less than $60 a week	1	10	20	6	6	3	7	2	55	19	21	38
$60-$74	2	6	6	7	2	5	0	5	33	11	8	24
$75-$89	1	15	9	7	4	14	7	7	64	21	35	55
$90-$104	0	10	14	2	4	10	4	2	46	15	20	43
$105-$119	2	5	13	0	1	3	0	0	24	8	5	21
$120-$134	0	2	4	1	0	3	0	1	11	4	3	27
$135-$149	0	1	0	0	1	0	0	0	2	1	0	00
$150-$164	1	0	1	0	0	0	1	0	3	1	2	67
$165-$179	0	0	0	0	0	0	0	0	0	0	0	0
$180- over	0	0	2	0	0	0	0	0	2	1	1	50
Not given	2	18	24	2	2	5	1	3	57	19	6	11
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING AVERAGE WEEKLY INCOME FROM EMPLOYMENT ON FIRST JOB AFTER COLLEGE

Average weekly income	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Less than $60 a week	3	0	0	11	3	8	1	0	12	16	0	1	0	55	19
$60-$74	6	0	0	8	0	2	4	0	1	11	0	0	1	33	11
$75-$89	3	0	12	14	6	3	4	0	13	5	3	1	0	64	21
$90-$104	5	0	4	4	7	5	1	0	4	10	3	3	0	46	15
$105-$119	0	0	2	3	5	3	0	1	3	3	3	1	0	24	8
$120-$134	0	0	2	0	0	4	0	0	1	3	0	1	0	11	4
$135-$149	0	0	0	0	1	0	0	0	1	0	0	0	0	2	1
$150-$164	0	0	0	0	0	0	1	0	0	2	0	0	0	3	1
$165-$179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$180 and over	0	0	0	0	0	0	0	0	0	0	1	0	1	2	1
Not given	2	2	0	9	12	3	1	0	4	12	5	4	3	57	19
Total	19	2	20	49	34	28	12	1	39	62	15	11	5	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Thirty per cent of the persons who studied electronics technology and industrial technology earned less than \$60 per week on the first job after college. Twelve of the 20 students from civil technology earned between \$75 and \$89 a week on the first job after college. No one who studied civil technology earned less than this. The highest weekly salary for any of the students in civil technology was between \$120 and \$134 per week. Even though the range of wages in metallurgical technology was from \$75 a week to over \$180 a week, only 1 student was in the latter category.

The earnings of the respondents in engineering technology range from less than \$60 a week to the interval \$135-\$149 which is the same range reported for students who studied mechanical technology. The highest salaries after college were reported by students who had studied metallurgical technology, mechanical technology, and engineering technology.

Eighty-three per cent of the graduates earned less than \$105 per week on the first job. The largest group, 35 per cent, had a starting salary of between \$75 and \$89 per week.

<u>Most recent salary</u>. The most recent information of the earning power of the 297 students who entered the curricula in industrial-technical programs is provided in Tables CXXX and CXXXI.

Table CXXX indicates that 50 per cent of the respondents had at this time, wages between \$75 and \$120 a week, inclusively. The median wage was \$101 a week. This represents a median wage \$14 higher than that received at the first job after college. While the percentage of individuals in the top bracket was only 1 per cent as on the first job after college, the percentage of individuals earning over $120 per week had increased from 7 per cent on the first job to 14 per cent at the present position. While 19 per cent earned less than $60 a week on the

TABLE CXXX

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING AVERAGE WEEKLY INCOME FROM EMPLOYMENT ON MOST RECENT OR PRESENT JOB

Average weekly income	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
Less than $60 a week	1	8	10	0	1	2	4	1	27	9	8	30
$60-$74	0	4	2	7	1	4	1	6	25	8	10	40
$75-$89	2	9	11	6	5	0	6	5	44	15	14	32
$90-$104	2	13	19	4	6	15	3	4	66	23	28	42
$105-$119	1	16	18	0	4	9	2	1	51	17	15	29
$120-$134	0	6	7	2	1	3	2	1	22	7	11	50
$135-$149	0	1	4	2	1	0	0	0	8	3	0	0
$150-$164	1	0	4	0	0	1	0	1	7	2	2	29
$165-$179	0	0	2	0	0	1	0	0	3	1	0	00
$180-over	0	0	2	0	0	0	0	0	2	1	1	50
Not given	2	10	14	4	1	8	2	1	42	14	12	29
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXXI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING AVERAGE WEEKLY INCOME FROM EMPLOYMENT ON MOST RECENT OR PRESENT JOB

Average weekly income	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Less than $60 a week	0	0	0	5	2	5	2	0	5	6	0	2	0	27	9
$60-$74	5	0	0	7	1	3	3	0	2	3	0	0	1	25	8
$75-$89	7	0	0	9	3	1	2	0	10	9	1	1	1	44	15
$90-$104	2	0	12	13	5	6	2	0	7	13	3	2	1	66	23
$105-$119	1	1	3	7	10	8	1	0	6	7	5	2	0	51	17
$120-$134	2	0	2	3	3	3	1	1	2	2	1	2	0	22	7
$135-$149	0	0	0	0	1	0	0	0	2	5	0	0	0	8	3
$150-$164	0	0	1	0	1	1	0	0	1	3	0	0	0	7	2
$165-$179	0	0	0	0	0	0	0	0	1	1	0	1	0	3	1
$180 and over	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1
Not given	2	1	2	5	8	1	1	0	3	13	4	1	1	42	14
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

first job after college, the percentage of individuals in this group had dropped to 9 per cent for the most recent salary.

Further analysis of the present or most recent wage structure is available in Table CXXXI according to the program pursued.

None of the following programs represented respondents whose current wages were less than \$60 a week: automotive technology, architectural technology, civil technology, industrial management technology, metallurgical technology. The bottom of the lowest interval for civil technology was \$90 a week and for metallurgical technology \$75 a week. The present top interval for respondents from automotive technology, civil technology, drafting technology, electronic technology, engineering technology, industrial management technology, and metallurgical technology were all within the same interval of \$135-\$149 a week, inclusively. One of the 2 individuals in the bracket of \$180 a week and over had studied mechanical technology.

Over 75 per cent of the graduates were earning between \$60 and \$134 inclusively on the present or most recent job held.

Respondents having drawn unemployment compensation. The picture of the employment status of the respondents is not complete without an analysis of the number having drawn unemployment insurance. Table CXXXII and Table CXXXIII supply this information.

Twenty-five per cent had drawn unemployment compensation, 68 per cent had not, and 7 per cent failed to indicate the response to this item. The percentage of graduates who had drawn unemployment compensation since leaving college was somewhat less than for the total respondents as shown in Table CXXXII.

Additional insight into the stability of employment in the areas of occupational education is obtained by a study of Table CXXXIII. None of the 20 respondents who studied civil technology needed to utilize the benefits of unemployment compensation. Less than 15 per cent of those who studied either electrical technology or metallurgical technology had up to the time of the study needed to draw unemployment compensation. But during the short time elapsed since these students enrolled on the various programs of study, approximately 1 person in 3 of those who had studied drafting technology, engineering technology, industrial technology, and mechanical technology had drawn unemployment compensation.

TABLE CXXXII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE HAVING DRAWN UNEMPLOYMENT COMPENSATION SINCE LEAVING COLLEGE

Response	Institution								Total	Per cent	Graduates No.	Graduates Per cent
	2	5	6	7	8	9	10	11				
Yes	3	15	19	11	3	6	9	9	75	25	19	25
No	5	46	63	14	16	34	11	11	200	68	77	39
Not given	1	6	11	0	1	3	0	0	22	7	5	23
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXXIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS HAVING DRAWN UNEMPLOYMENT COMPENSATION SINCE LEAVING COLLEGE

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	5	1	0	16	4	6	4	0	15	19	2	3	0	75	25
No	13	1	19	31	23	22	7	1	24	37	11	8	3	200	68
Not given	1	0	1	2	7	0	1	0	0	7	1	1	1	22	7
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Could have obtained job without community junior college education. Fifty-eight per cent of the students believed they could have obtained their present job without having attended the community junior college according to Table CXXXIV. Another 25 per cent did not believe they would have secured their present job without such education, while 10 per cent said they did not know. However, 41 per cent of the graduates said that they would not have obtained their present job without the college education.

This problem is further analyzed in Table CXXXV. While many of the students may have seriously overrated their previous knowledge and competencies, approximately two-thirds of those in the automotive technology, electrical technology, engineering technology, industrial

TABLE CXXXIV

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT HE COULD HAVE OBTAINED PRESENT JOB WITHOUT ATTENDING COMMUNITY JUNIOR COLLEGE

Response	Institution								Total	Per cent	Graduates No.	Graduates Per cent
	2	5	6	7	8	9	10	11				
Yes	5	35	66	16	12	17	9	11	171	58	41	24
No	1	21	13	6	5	17	7	4	74	25	41	55
Don't know	1	4	7	3	3	7	4	3	32	10	15	47
Not given	2	7	7	0	0	2	0	2	20	7	4	20
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXXV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT HE COULD HAVE OBTAINED PRESENT JOB WITHOUT ATTENDING COMMUNITY JUNIOR COLLEGE

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	12	2	6	27	22	19	8	0	22	40	3	9	1	171	58
No	3	0	10	12	4	7	2	1	10	13	9	2	1	74	25
Don't know	3	0	4	4	4	2	1	0	7	5	1	0	1	32	10
Not given	1	0	0	6	4	0	1	0	0	5	1	1	1	20	7
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

technology, and mechanical technology curricula fields nonetheless believed that the knowledge and skill gained in the community junior colleges was not absolutely essential for them to secure their present job. Less than 1 student in 3 who studied civil technology or metallurgical technology shared this point of view.

<u>Present job closely related to college education</u>? Is your present job closely related to the education received at the community junior college? This question from the questionnaire brought somewhat different responses than the previous one. The results are given in Tables CXXXVI and CXXXVII.

Forty per cent said that their present job was closely related, 50 per cent said it was not, and only 1 per cent did not know. However,

TABLE CXXXVI

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THE PRESENT JOB IS CLOSELY RELATED TO THE EDUCATION RECEIVED AT THE COMMUNITY JUNIOR COLLEGE

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Per cent
Yes	2	24	26	16	12	25	8	8	121	40	53	44
No	5	34	59	7	6	16	12	10	149	51	40	27
Don't know	0	1	1	1	1	0	0	0	4	1	1	25
Not given	2	8	7	1	1	2	0	2	23	8	7	30
Total	9	67	93	25	20	43	20	20	297	100	7	30
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXXVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THE PRESENT JOB IS CLOSELY RELATED TO THE EDUCATION RECEIVED AT THE COMMUNITY JUNIOR COLLEGE

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	7	0	17	16	13	8	5	1	17	22	10	4	1	121	40
No	10	1	3	26	17	19	6	0	22	36	2	6	1	149	51
Don't know	0	0	0	1	0	1	0	0	0	0	1	0	1	4	1
Not given	2	1	0	6	4	0	1	0	0	5	1	2	1	23	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

53 per cent of the graduates said that their present job was closely related, 40 per cent said that it was not, and again only 1 per cent did not know.

Eighty-five per cent of the individuals who studied civil technology stated that their present job was closely related to the community junior college education. Table CXXXVII is the source of this and related data. Only approximately 1 student in 3 from the curricula of drafting technology, electrical and electronics technology, and mechanical technology felt that they held jobs closely related to their college educational experience. While less than one-half of the students in engineering technology believed that there was a close relationship between the two, 10 of the 14 respondents from metallurgical technology felt that in their case a close relationship existed between the educational experiences in the community junior college and their present job.

<u>Did the community junior college education help in securing the first job after leaving college</u>? While somewhat related to the previous two questions, the degree of the implication is different. The opinions of the students are recorded in Tables CXXXVIII and CXXXIX.

In spite of the slight shift in emphasis only 39 per cent of the students believed the community college education did help them secure their first job. Fifty per cent did not agree, while 2 per cent did not know. A study of the graduates indicates that 60 per cent believed the education helped and only 32 per cent took the position that it did not help in securing the first job.

Worthy of diligent study and concentrated effort by many of the institutions are the implications contained in Table CXXXIX relating to the analysis of this problem by programs.

A strong positive approach was expressed by 19 of the 20 students who studied civil technology. They maintained that their community junior college education did help in securing the first job. Eleven of the 14 respondents from the curricula of metallurgical technology supported this position. Only 6 of the 34 students who studied electrical technology, and 3 of the 12 students who studied engineering technology believed that their education helped them to secure their first position. Five of the 19 students enrolled in automotive technology expressed the same point of view.

TABLE CXXXVIII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT EDUCATION AT THE COMMUNITY JUNIOR COLLEGE HELPED IN SECURING THE FIRST JOB AFTER COLLEGE

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	4	27	16	10	8	28	13	9	115	39	60	52
No	3	30	66	13	10	13	7	7	149	50	32	21
Don't know	0	1	1	2	1	0	0	0	5	2	2	40
Not given	2	9	10	0	1	2	0	4	28	9	7	25
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXXXIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT EDUCATION AT THE COMMUNITY JUNIOR COLLEGE HELPED IN SECURING THE FIRST JOB AFTER COLLEGE

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	5	0	19	20	6	10	3	1	20	18	11	1	1	115	39
No	11	2	1	22	23	17	6	0	17	38	2	9	1	147	50
Don't know	0	0	0	2	0	0	1	0	0	1	0	1	0	5	2
Not given	3	0	0	5	5	1	2	0	2	6	1	1	2	28	9
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Requirement of additional training. In this item the effort was made to ascertain whether or not the first employer required additional training of the respondent in order to fulfill the requirements of the position. The analysis according to colleges is given in Table CXL and according to program studied in Table CXLI.

One student in 4 said that he needed additional training to fulfill the job requirements. A slightly smaller per cent of the graduates indicated that they also needed additional training to fulfill the requirements of the first job.

Twenty-four of the 63 students from mechanical technology needed additional training for the job. While the percentage of students of the other curricula did not as often require additional training, some

TABLE CXL

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING WHETHER THE FIRST EMPLOYER REQUIRED ADDITIONAL TRAINING IN ORDER TO FULFILL THE JOB REQUIREMENT

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	2	12	31	7	2	9	7	3	73	25	23	32
No	5	47	52	16	15	31	13	14	193	65	70	36
Don't know	0	2	0	2	1	1	0	0	6	2	3	50
Not given	2	6	10	0	2	2	0	3	25	8	5	20
Total	6	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	6	7	14	7	7		100	34	

TABLE CXLI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING WHETHER THE FIRST EMPLOYER REQUIRED ADDITIONAL TRAINING IN ORDER TO FULFILL THE JOB REQUIREMENTS

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	3	0	5	10	8	7	2	0	10	24	1	2	1	73	25
No	15	2	14	33	21	19	8	0	26	32	11	9	2	193	65
Don't know	0	0	1	1	0	1	0	1	1	1	1	0	0	6	2
Not given	1	0	0	5	5	2	2	0	2	6	1	1	1	25	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

students in all programs except industrial management technology and architectural technology, did need additional training to fulfill the job requirements.

Keeping up with new developments. Tables CXLII and CXLIII reflect the opinions of the respondents relative to the problem of keeping up with new developments.

Twenty-nine per cent said that it was difficult to keep up with new developments but 53 per cent said that it was not difficult to do so.

The very obvious fact that new developments are much more important in some fields than in other fields and also much more numerous in some of these fields is brought out in Table CXLIII. While approximately

TABLE CXLII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT IT IS HARD TO KEEP UP WITH NEW DEVELOPMENTS

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	2	24	19	6	5	17	8	5	86	29	40	47
No	4	28	59	13	10	22	7	12	155	52	49	32
Don't know	1	9	4	5	2	3	4	2	30	10	9	30
Not given	2	6	11	1	3	1	1	1	26	9	3	12
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXLIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT IT IS HARD TO KEEP UP WITH NEW DEVELOPMENTS

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	9	1	9	9	9	16	0	0	11	13	6	2	1	86	29
No	7	1	11	26	18	12	9	1	17	36	6	9	2	155	53
Don't know	2	0	0	9	2	0	2	0	7	6	2	0	1	31	10
Not given	1	0	0	5	5	0	1	0	4	8	0	1	0	25	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

one-half of those who were working in an occupation resulting from the study of automotive technology, civil technology, electronics technology, and metallurgical technology felt that it was hard to keep up with new developments, none of the respondents from engineering technology and a fairly small percentage of those from electrical technology and also from mechanical technology took the same position.

Ten per cent of the total population reporting had difficulty in deciding whether or not it was hard to keep up with new developments. A larger percentage of the graduates than of the total respondents stated that it was hard to keep up with new developments.

Union membership. Union membership of the respondents is the subject covered in Table CXLIV and CXLV. Twenty-three per cent of the respondents had union membership and 70 per cent did not, as shown in

TABLE CXLIV

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING UNION MEMBERSHIP

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	3	14	40	3	2	2	2	3	69	23	16	23
No	5	48	42	20	17	38	18	17	205	70	82	40
Don't know	0	0	0	1	0	0	0	0	1	0	0	00
Not given	1	5	11	1	1	3	0	0	22	7	3	14
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXLV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING UNION MEMBERSHIP

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	2	0	0	13	13	10	1	0	9	17	1	3	0	69	23
No	16	1	20	34	17	18	10	1	28	36	13	8	3	205	70
Don't know	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Not given	1	1	0	2	4	0	1	0	2	9	0	1	1	22	7
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

Table CXLIV. Sixteen per cent of the graduates were union members while 82 per cent were not.

None of the students who studied architectural technology, civil technology, or industrial management technology had joined the unions. But approximately one-third of those who studied electrical or electronics technology or mechanical technology were members of the unions. While some of the other respondents had joined the unions, the percentage in most cases was not large. About 20 per cent of those who studied metallurgical technology, engineering technology, and automotive technology were members of the unions.

Those Who Graduated

At the beginning of this chapter we were concerned about 297 individuals who initially enrolled in a number of different programs in eight public community junior colleges in Michigan. Throughout the chapter efforts havebeen made to identify and characterize these individuals, the programs they participated in and to some extent the institutions they attended. Now the concern is directed specifically to the number of these 297 students who successfully completed the program and graduated.

Number graduating. The number and the percentage of the graduates is given in Table CXLVI and CXLVII.

Thirty-four per cent or a total of 101 students graduated while 63 per cent did not. According to Table CXLVI, 3 per cent failed to indicate whether or not they graduated.

The statistics by institutions suggest considerable variation in the percentage that graduated from each of the participating colleges. Institution 10 ranked highest with 80 per cent of the respondents graduating. Institution 7 had only 12 per cent of its respondents that had graduated, and Institution 6 had 15 per cent that graduated. Nearly one-half of the students who responded from Institutions 5, 8, 9 and 11 completed the program and graduated. One student in Institution 3 that entered Institution 2 in industrial-technical programs had graduated by the time of this study. Institution 2 had approximately the same percentage as the average of all the participating colleges for the population in this respect.

Table CXLVI provides data according to the programs enrolled in. Two out of every 3 students that enrolled in metallurgical technology graduated; whereas, none of the 2 students from architectural technology secured their diplomas. Over one-half of the students studying

TABLE CXLVI

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING GRADUATION FROM INDUSTRIAL-TECHNICAL CURRICULA

Response	Institution								Total	Per cent
	2	5	6	7	8	9	10	11		
Yes	3	28	14	3	9	19	16	9	101	34
No	6	36	79	21	10	22	3	10	187	63
Not given	0	3	0	1	1	2	1	1	9	3
Total	9	67	93	25	20	43	20	20	297	100
Per cent	3	23	31	8	7	14	7	7		100

TABLE CXLVII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING GRADUATION FROM INDUSTRIAL-TECHNICAL CURRICULA

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	10	0	11	13	11	7	4	1	22	9	9	3	1	101	34
No	7	2	8	34	23	21	6	0	15	54	5	9	3	187	63
Not given	2	0	1	2	0	0	2	0	2	0	0	0	0	9	3
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

automotive technology, civil technology, or industrial technology graduated; on the other hand only about 25 per cent from drafting technology and 15 per cent of those who began the study of mechanical technology completed the program and graduated.

Job Satisfaction

Industrial psychologists and many others are concerned about the problem of job satisfaction. The purpose of this investigation was also to ascertain from the individuals who had experienced the educational program and later had joined the "world of work", the degree of their job satisfaction. Another factor significant in the evaluation of job satisfaction was whether or not the individuals were employed on the kinds of jobs they had prepared for at the community junior college.

Satisfied with job. As indicated in Table CXLVIII, 48 per cent said that they were well satisfied with the job, 35 per cent said they were not well satisfied, 7 per cent did not know, and 10 per cent failed to check a response for the item. A study of this table suggests that the job satisfaction is not closely related with graduation as about the same percentages are reflected in each category for the graduates as for the total respondents.

Study of Table CXLVIII reveals that actually there is very little difference between the colleges attended in the degree of job satisfaction reported by the respondents. There were some differences when curricula are examined. Fifteen of the 20 enrolled in civil technology were highly satisfied with their jobs as reported in Table CXLIX. Eleven of the 19 that studied automotive technology were also well satisfied with their jobs. About one-half or less of those who studied drafting technology, electrical technology, electronics technology, industrial technology, mechanical technology, and metallurgical technology were well satisfied with their occupations. Only 4 of the 12 that pursued the engineering technology curriculum were well satisfied with the position they obtained.

Working at the kind of job prepared for. In order that students who enroll in a certain curriculum may realistically have some idea as to whether or not most students who have studied the same curriculum succeed in finding employment in it, this item was included in the questionnaire.

TABLE CXLVIII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE INDICATING THAT THEY WERE WELL SATISFIED WITH THEIR JOBS

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	4	31	43	17	8	22	9	8	142	48	45	32
No	3	27	30	5	6	15	9	9	104	35	39	38
Don't know	1	2	6	1	3	4	2	1	20	7	8	40
Not given	1	7	14	2	3	2	0	2	31	10	9	29
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CXLIX

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS INDICATING THAT THEY WERE WELL SATISFIED WITH THEIR JOBS

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	11	1	15	22	16	11	4	1	17	29	7	6	2	142	48
No	5	0	4	18	11	15	6	0	16	21	5	3	0	104	35
Don't know	1	0	1	5	0	2	1	0	4	4	1	0	1	20	7
Not given	2	1	0	4	7	0	1	0	2	9	1	3	1	31	10
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1	.	100

A brief summary of the findings show that 35 per cent were working at the kind of job prepared for while at the college and 55 per cent were not, as shown in Table CL. However, 47 per cent of the graduates were working at the kind of job prepared for while in college.

A high degree of correlation seemed to exist between the kind of position prepared for and the kind of position secured by those who selected to study civil technology and metallurgical technology as indicated in Table CLI. On the other hand, less than 30 per cent of those who studied automotive technology, electrical technology, electronics technology, or mechanical technology were presently working at the kind of job prepared for while at college.

TABLE CL

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE WHO INDICATED WORKING AT THE KIND OF JOB PREPARED FOR WHILE ATTENDING THE COMMUNITY JUNIOR COLLEGE

Response	Institution 2	5	6	7	8	9	10	11	Total	Per cent	Graduates No.	Graduates Per cent
Yes	3	20	21	13	8	24	7	8	104	35	47	45
No	4	38	63	10	10	16	12	9	162	55	45	28
Don't know	0	2	0	1	1	1	1	1	7	2	2	29
Not given	2	7	9	1	1	2	0	2	24	8	7	29
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CLI

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS WHO INDICATED WORKING AT THE KIND OF JOB PREPARED FOR WHILE ATTENDING THE COMMUNITY JUNIOR COLLEGE

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	5	0	16	17	9	6	4	1	14	18	8	3	1	104	35
No	11	2	4	26	20	20	6	0	23	37	4	7	2	162	55
Don't know	1	0	0	1	0	0	1	0	2	1	1	0	0	7	2
Not given	2	0	0	5	5	0	1	0	0	7	1	2	1	24	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

The average of 35 per cent working at the kind of job prepared for while at college is a rather close representation of the response from the students who studied engineering technology, and industrial technology.

Other Information

In this miscellaneous classification are four tables dealing with the students' responses to two items. The first series relates to the item, "Has the employer provided for you a company training program?" The second series relates to the item, "Do you think the community junior college courses you took will help you secure a position in 'middle management' if you so desire?" The final table of this section summarizes the specific comments and suggestions made by the respondents on the questionnaire.

Company training program. Data relative to the fact that a large percentage of the respondents was in need of additional training to meet the needs of the first job were presented in Table CXL. The item under consideration relates to whether or not the employer provided a company training program for the employees. The tabular information in Table CLII provides an analysis according to the college attended, while that in Table CLIII presents the statistics analyzed according to the program studied.

Thirty-three per cent of the respondents stated that the company did provide a training program, but 55 per cent said that no training program was provided by their employer. Two per cent did not know and 10 per cent failed to check this item on the questionnaire.

Table CLIII provides information indicating that in mechanical technology 25 of the 63 respondents were employed by firms that did provide a company training program. About one-third of the respondents who studied drafting technology also reported that the employer provided a company training program. But in the field of employment of those who studied metallurgical technology, only 1 of the 14 respondents stated that the employer provided a company training program.

"Middle-management" positions. To what extent will the courses taken at the community junior college in the industrial-technical curricula help these individuals obtain positions in "middle-management"? To learn how the students viewed this question, see Tables CLIV and CLV.

TABLE CLII

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE WHO INDICATED THAT THE EMPLOYER PROVIDED A COMPANY TRAINING PROGRAM

Response	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
Yes	3	13	42	11	3	11	6	7	96	33	29	30
No	4	45	37	13	13	29	13	11	165	55	60	36
Don't know	0	1	2	0	2	1	1	0	7	2	4	57
Not given	2	8	12	1	2	2	0	2	29	10	8	28
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CLIII

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS WHO INDICATED THAT THE EMPLOYER PROVIDED A COMPANY TRAINING PROGRAM

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	2	0	5	14	13	13	4	0	12	25	1	5	2	96	33
No	15	2	14	28	14	15	7	1	23	28	12	5	1	196	55
Don't know	0	0	1	1	1	0	0	0	3	1	0	0	0	7	2
Not given	2	0	0	6	6	0	1	0	1	9	1	2	1	29	10
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

A little more than one-third of the students said that these courses would help while exactly one-third said that these courses would not help and somewhat less than one-third indicated they did not know whether these courses would help or not to obtain a position in "middle-management". Table CLIV provides information suggesting that a higher percentage of graduates believed that courses taken will help them secure "middle-management" positions.

While extreme positions by any of the groups is not indicated by the tabular data provided in Table CLV, approximately 50 per cent of the students who were optimistic concerning the benefit of the courses, had studied either civil technology or industrial technology. But only 25

TABLE CLIV

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH COLLEGE WHO INDICATED THAT COMMUNITY JUNIOR COLLEGE COURSES WOULD HELP THEM SECURE "MIDDLE-MANAGEMENT" POSITIONS

Response	Institution								Total	Per cent	Graduates	
	2	5	6	7	8	9	10	11			No.	Per cent
Yes	3	21	33	13	7	21	11	4	113	37	45	40
No	2	28	30	7	7	11	4	7	96	33	24	25
Don't know	2	13	19	3	5	9	5	8	64	22	26	41
Not given	2	5	11	2	1	2	0	1	24	8	6	25
Total	9	67	93	25	20	43	20	20	297	100	101	
Per cent	3	23	31	8	7	14	7	7		100	34	

TABLE CLV

NUMBER AND PERCENTAGE OF RESPONDENTS BY PROGRAMS WHO INDICATED THAT COMMUNITY JUNIOR COLLEGE COURSES WOULD HELP THEM SECURE "MIDDLE-MANAGEMENT" POSITIONS

Response	Automotive technology	Architectural technology	Civil technology	Drafting technology	Electrical technology	Electronics technology	Engineering technology	Industrial management technology	Industrial technology	Mechanical technology	Metallurgical technology	Other	Changed curriculum	Total	Per cent
Yes	4	1	11	14	12	9	3	1	19	24	6	6	3	113	37
No	9	1	6	18	13	14	4	0	9	14	4	3	1	96	33
Don't know	5	0	3	13	5	5	4	0	10	14	3	2	0	64	22
Not given	1	0	0	4	4	0	1	0	1	11	1	1	0	24	8
Total	19	2	20	49	34	28	12	1	39	63	14	12	4	297	100
Per cent	6	1	7	17	11	9	4	0	13	22	5	4	1		100

per cent of those who had studied automotive technology, or engineering technology felt that the courses they had taken would be of help in securing positions in "middle-management".

Comments and suggestions. The students were invited to make any comments or suggestions which they thought would be helpful in making improvements in the community junior college programs or in other ways to improve learning. Many of the respondents availed themselves of this opportunity.

In order to tabulate these comments they were classified under four headings: counseling and guidance, curricula, instruction, and general.

In some cases more than one individual commented on the same subject in about the same way, in which case, as found in Table CLVI, these have been designated by an asterisk in front of the number. Those items which do not have the asterisk reflect the point of view of only one individual.

TABLE CLVI

COMMENTS AND SUGGESTIONS MADE BY STUDENT RESPONDENTS

Classification of comment	Comment
Counseling and guidance	*1. Students should be counseled more and better.
	*2. College should help a graduate to get a job.
	*3. Not enough guidance in educational selection
	4. While still in high school, a young man should be shown and told what problems he will face when he is out.
	5. There are too many social activities and very, very poor counseling service.

TABLE CLVI (continued)

Classification of comment	Comment
Curricula	*1. On-the-job training would be very beneficial in technical programs.
	2. College should scale their technical program to the demands of industry.
	3. Two years of college is not enough. Industry will not recognize a two-year curriculum as enough.
	*4. Suggest more courses that are transferable.
	*5. Courses were too general in scope.
	6. Electrical technicians should have a better mathematics background.
	7. Too much theory and not enough practical applications.
	8. Need more emphasis on trades and less on English and history.
	9. Have the college work along with industry in planning the curriculum.
	10. Not enough subjects are offered.
	11. The training in electronics was not complete enough for a job.
	12. Should have more theory.
	13. Any person preparing for an industrial career should have at least one course in industrial relations.
	14. Place greater stress on leadership.
	15. Need more technical English; less of the other.
Instruction	*1. Part-time instructors from surrounding industry should be "screened" more carefully.
	*2. Have instructors who are interested.
	*3. One instructor knew less about the welding field than the students.
General	*1. Should have more discipline for immature students.
	*2. Community college gave a good background for the industrial education curriculum.
	*3. Fully satisfied with the community college.
	4. The supply of mechanical draftsmen is greater than the demand at the present time.
	5. About 15 boys started the drafting technology course. One finished. Fourteen would have liked to have finished but how could anyone make it!

TABLE CLVI (continued)

Classification of comment	Comment
	6. The college shows little interest in students who must attend classes at night.
	7. The college is too crowded; there is not enough time or equipment.

Summary

The study of the students who initially enrolled in industrial-technical programs during the school year 1958-59 resulted in many interesting findings. The respondents numbered 297, of these 101 (34 per cent) graduated. The summary is divided into two distinct parts, the summary as related to the total respondents and the summary as related only to the graduates.

Summary - total respondents.

1. One hundred per cent were male.
2. Slightly over one-half were residents of the local district.
3. Two out of every 3 students came from homes where the father's occupation was either unskilled, semiskilled or skilled labor.
4. Ten per cent had previously enrolled in another college or university.
5. Only 29 per cent completed 4 semesters of full-time college work.
6. Twenty-two per cent completed between 61 and 72 semester hours, while 20 per cent completed 24 semester hours or less of college work.
7. Approximately seven-eighths of the students were in continuous

enrollment.

8. Thirty-eight per cent would make the same occupational choice as they did at the time of their initial enrollment.
9. While most guidance functions were given ratings by the students of "good", many of them were highly critical of the assistance received from the college in obtaining a job.
10. Eight per cent of those who did not graduate were still attending the community junior college, 7 per cent had transferred to another college, while 5 per cent had accepted apprenticeships.
11. Seven per cent of those who terminated without graduation indicated that their occupational goals were uncertain, 6 per cent listed financial problems, while another 6 per cent gave low grades as the reason for termination.
12. Only 6 per cent were employed in states other than Michigan.
13. Twenty-five per cent had drawn unemployment compensation at some time since termination of college.
14. About one out of every 4 respondents were members of unions.
15. Nearly 75 per cent of the students were in the age group of 17 through 20 with only about 1 per cent over the age of 30 at the time of initial enrollment.
16. About one-half of the respondents were well satisfied with their jobs.
17. Over one-half of the respondents expressed the opinion that they could have secured their present position without attending the community junior college.
18. Thirty-nine per cent were willing to admit that the community junior

college education did help them secure their first job, and 40 per cent said that the present job was closely related to their community junior college education.

19. Only 35 per cent said they were working at the kind of job they prepared for while at college.
20. Twenty-five per cent stated that the first employer required additional training for the job.
21. Thirty-three per cent said that the employer did provide a company training program.
22. Over 80 per cent indicated that the college facilities and classroom activities were conducive to studying and learning.
23. A few respondents felt that the courses were either too general or too specific.
24. Thirty-one per cent felt that too much emphasis was placed on theory and not enough on practical applications.
25. Nearly one-half of the students indicated that more time should be devoted to developing hand or machine skills.

<u>Summary</u> - <u>graduates</u>.

1. Approximately 80 per cent were between the ages of 17 and 20, inclusively.
2. Over one-half were single while in college.
3. The percentage of residents and non-residents was about the same as for the total respondents.
4. Fourteen per cent were previously enrolled in another college or university.

5. About one-third had fathers who were employed in the skilled labor field.
6. Most, 61 of 101, were C students in high school, but, 2 had a D average.
7. Approximately 44 per cent of the students financed their education by personal savings or work.
8. While 45 per cent attended the regular 4 semesters, 21 per cent attended 5, and 18 per cent attended 6 semesters.
9. Approximately one-half were in part-time attendance at some time prior to graduation.
10. Ninety-five per cent participated continuously on a sequential program.
11. Sixty-two per cent completed the curricula in a two-year period.
12. Eighty per cent devoted only two years to technical curricula in college.
13. Forty-one per cent said they had a B average in college and 59 per cent indicated a C average.
14. Sixty-six per cent held part-time jobs and 17 per cent held full-time jobs while attending college.
15. Twenty-one per cent earned $50 or more per week while attending college.
16. A higher percentage than of the total respondents believed that the assistance rendered in helping the students adjust at college was either good or excellent.
17. Sixty-eight per cent rated counseling on school problems as excellent or good while only 50 per cent of the total respondents rated these

services as good or excellent.

18. Approximately 30 per cent characterized the assistance in obtaining a job as very poor.
19. The most helpful courses, in descending order, were drafting and design, technology, mathematics, and English.
20. The least helpful courses, in descending order, were physical education, social science, art, English, and architecture.
21. The areas in which additional courses would have been helpful, in descending order, were mathematics, leadership training, psychology, engineering, and English.
22. Subjects that need to be geared more to the needs of the technicians, in descending order, were English, mathematics, electronics, electricity, and leadership training.
23. Only 3 per cent said that the majority of courses were too specific, while 20 per cent said the courses were too general.
24. Forty-four per cent believed the courses were too short; only 1 per cent said that the program of study was too long.
25. Twenty-two per cent said that too much emphasis was placed on theory and 13 per cent indicated that too much emphasis was placed on practical applications.
26. Forty-two per cent indicated that the amount of time devoted to developing hand or machine skills should be increased.
27. Sixty-eight per cent indicated a desire to take additional courses.
28. The percentage employed on full-time jobs (77 per cent) and on part-time jobs (6 per cent) after leaving college was almost identical with the total respondents.

29. Forty per cent of the graduates were employed on technician jobs as compared with 24 per cent of the total respondents.

30. Seventy-two per cent of the graduates were employed in the same community or within an area of 50 miles of the community college attended. Only 7 per cent were being employed in states other than Michigan.

31. There was very little difference in the median salary as compared with the total respondents on the first job after college and, also, as reported on the most recent or present job.

32. Nineteen per cent indicated having drawn unemployment compensation since leaving college as compared with 25 per cent of the total respondents.

33. Forty-one per cent said they could have obtained their present job without attending the community junior college as compared with 58 per cent of the total respondents.

34. Fifty-three per cent indicated that the present job was closely related to the education received at college; 40 per cent of the total respondents agreed.

35. Sixty per cent indicated that the education at college helped in securing the first job after college but only 39 per cent of the total respondents took the same viewpoint.

36. Twenty-three per cent stated that the first employer required additional training in order to fulfill the job requirements.

37. Forty per cent said that it was hard to keep up with new developments.

38. Sixteen per cent of the graduates were members of the unions; 23 per

cent of the total respondents were union members.

39. Forty-five per cent were well satisfied with their jobs.

40. Forty-seven per cent were working at the kind of job prepared for at college.

41. Forty-five per cent believed that the courses taken would help them secure "middle management" positions; however, only 37 per cent of the total respondents shared this position.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this part is to briefly review the nature of the study and present a recapitulation of the more significant findings.

The objective was to study the characteristics of the students, the teachers, and the curriculum of industrial-technical education in the public community junior colleges of Michigan to gain information and suggest possible improvements.

Two distinct methods were employed. The documentary approach was utilized in securing information to characterize the teachers and the curriculum. The questionnaire was employed to secure information to characterize the students.

In order to secure authentic information about the teachers, permission was secured to utilize information in the files on vocational certification of teachers as contained in the office of the Superintendent of Public Instruction. The use of the documentary method involved study and analysis of the literature of various community junior colleges offering programs in industrial-technical curricula.

Careful preparation of the questionnaire and the contact letters utilized for securing the data from the students resulted in a response from 297 individuals constituting 72 per cent of the population. The high percentage of responses resulted from numerous follow-up letters, personal telephone calls, contacts with the administrative personnel of the various participating colleges, and excellent cooperation from all individuals concerned.

Tabulation of the data was expedited by the use of the facilities of the Data Processing Center of Michigan State University.

Recapitulation of the characteristics of the teachers. During the school year 1960-61, 138 teachers were employed by the public community junior colleges in Michigan on programs of industrial-technical education involving monies allocated in accordance with the provisions of the National Defense Education Act, Title VIII. Seventy-five of these instructors were employed by 5 of the 11 colleges. The 2 largest colleges employed nearly one-half of the faculty members teaching in this field.

One-half of these instructors had earned at least the master's degree; many had exceeded this mark. Industrial arts was heavily represented among the bachelor's degrees of the instructors. Forty-one of the 59 teachers receiving the master's degrees, received an education-oriented degree in such an area as industrial education, industrial arts, or vocational education.

The median of courses in teacher education was 6 semester hours. In technical courses the median was 18 credits. Approximately 55 per cent of the instructors had taken less than 25 semester hours in courses of technical subjects even though 1 in 4 had taken more than 48 credit hours of course work in technical subjects. Two of every 3 instructors earned the bachelor's and the master's degrees in Michigan.

To what extent did the instructors have an intimate knowledge of industry? Twenty-one of the 138 instructors had completed an apprenticeship. The median work experience of these instructors was 76 months with a median of 50 months in closely related work experience.

Eighteen per cent of the instructors had permanent vocational certificates. Twenty-six per cent were teaching with a one-year special vocational certificate. Nearly two-thirds of the instructors also had general education certificates. Thirty-eight per cent had community college certificates of which 32 per cent were community college permanent certificates.

Forty-seven per cent of the instructors were classified as full-time, all-day trade instructors. Slightly over 30 per cent were listed as less than full-time, all-day trade instructors.

The median number of years of teaching experience was approximately 8. However, one out of every 4 indicated 3 years or less, and 13 per cent indicated no previous teaching experience.

The male sex composed most of the group as only 1 instructor was female.

Recapitulation of the characteristics of the curricula. College catalogs and brochures contained the industrial-technical curricula of 13 different public community junior colleges. Some colleges listed only one curricula, others listed several. Thirty-eight different programs were classified under 13 main headings. The most common curriculum was drafting technology. The least frequently mentioned were architecture, body drafting, and industrial management technology.

Each of the programs of the various colleges were identified, analyzed by courses, tabulated, and compared with the course offerings of the other colleges having the same curricula.

While the catalogs and brochures did not provide great detail, most gave some indication of the objectives. Inherent in these objectives were expressions of some individual experiences and philosophies. This seemed apparent in the shifting of the emphasis of the subject matter from program to program and college to college. For instance, within the same general curricula some colleges had provided a much heavier emphasis on mathematics than others, or on applied sciences than others, or upon business and economics than others. Some colleges had provided courses that were more theory-oriented. Other colleges leaned more toward practical applications.

Each of the colleges had established requirements for admission and graduation. While differences did exist, and are indicated in Chapter IV, the most common admission requirement listed was graduation from high school. Three colleges listed in their catalogs additional requirements for admission. Most of the colleges required successful completion of 62 semester hours for graduation. Successful completion required in most cases an honor point ratio of 2. One college required 83 semester hours with an honor point ratio of 2 for graduation.

Recapitulation of the characteristics of the students. Questionnaires were returned by 297 students, 72 per cent of the total population. These students initially enrolled in industrial-technical curricula in 8 public community junior colleges in Michigan during the school year, 1958-59.

All of the 297 students were male and about 75 per cent were under the age of 21 at the time of initial enrollment. Only 12 per cent were married and 54 per cent were residents of the local district at that time.

Ten per cent had previously attended another college or university. Sixty-five per cent said they had a C average in high school.

About 60 per cent came from homes in which the father worked as either an unskilled, semiskilled, or a skilled worker.

Work, financial assistance from parents, and personal savings were the most important methods of financing the education for these students.

Thirty-four per cent indicated less than 3 semesters of full-time college work. Over one-half had taken some work in college on a part-time basis. While more than 10 per cent took less than 13 semester hours, 39 per cent completed 61 or more semester hours. Eighty-six per cent of the students were enrolled on a continuous sequential program even though only 25 per cent completed the requirements of the program in the two-year period. Four per cent of the students that enrolled during the year 1958-59 were still on the program 4 years later.

Fifty-two per cent of the students worked on part-time jobs and 22 per cent on full-time jobs while attending college. Twenty-six per cent of the respondents earned $50 or more per week while attending college.

Thirty-eight per cent said that they would select the same occupation now as they initially selected. Ten per cent said that they would select instead a trade and 15 per cent indicated they would enter a profession if the decision were to be made now. On the whole the students were well satisfied with the way the various guidance and counseling functions were being performed with the exception of the placement function, which was considered poor or very poor by several respondents.

Four of every 10 students secured the first job through their own efforts. Only 8 per cent obtained the job through the college placement service.

Some effort was made to establish the high school quartile rank as an effective tool for predicting success or failure in college. A stratified population was selected and a number of relationships was established. Some of these included the relationship between high school quartile rank and other factors such as college grade point average, number of semester hours earned in college, and quartile rank on college entrance tests. Two-way tables were employed for multiple cross checking of the relationships between the variables. Continuous study of this instrument over a period of time could result for each of the colleges in the establishment of relationships which would permit highly valid predictors of success in college.

Students were given the opportunity of expressing their opinions as to the courses they felt were very helpful, and those not helpful. Also, the students were invited to indicate what courses, in addition to those available, they would have found helpful. Another item provided opportunity for students to indicate courses they believed needed to be geared more to the needs of the technicians. In general, the industrial-technical students indicated as the most helpful course areas, drafting and design, mathematics, electricity and electronics, English, and technology subjects. English drew the largest number of responses as the course that needed to be geared more to the needs of technicians, with mathematics second.

Eighty-three per cent were of the opinion that the community junior colleges offered a good environment in which to study and learn.

Nineteen per cent of the students thought the courses were too general. Only 4 per cent thought the courses were too specific. Twenty-seven per cent believed that a two-year program was too short; whereas, 3 per cent believed it was too long.

Thirty-one per cent said too much emphasis was placed on theory and not enough on practical applications. Eight per cent indicated that too much emphasis was placed on practical applications and not enough on theory. Forty-three per cent believed that the amount of time devoted to the developing of hand and machine skills should be increased.

Over one-half of the students expressed a desire to take more courses in industrial-technical subjects.

What happened to the students that had not graduated? According to the responses received, 8 per cent were still attending the community junior college; 7 per cent had transferred to another college; 5 per cent had accepted an apprenticeship; and 7 per cent had entered the military services. Most of the students who transferred to another institution, transferred either to Michigan State University or Western Michigan University. Ten of the 18 who entered apprenticeships, selected tool and die work or a related apprenticeship. The reasons for termination are given as follows with the percentage of students indicating each: occupational goal uncertain, 7 per cent; financial, 6 per cent; personal, 6 per cent; low grades, 6 per cent; and, courses too general, 3 per cent.

Eighty-six per cent of the respondents were presently employed on either a full-time or a part-time job. Twenty-four per cent were employed at a job which they considered to be technician's job, while 15 per cent were employed on skilled jobs. More than three-fourths of the students were employed in Michigan with 49 per cent being employed in the same community in which the community junior college was located. The largest number employed in a state other than Michigan, was in California. The median salary of the total population on the first job after college was $87 per week while on the present job it was $101 a week. Twenty-five per cent of the group had drawn unemployment compensation at some time since leaving college.

The students were asked to express their opinions on several items relating to their educational and occupational experiences. Some of the interesting opinions expressed by the students were as follows. Fifty-seven per cent believed that they could have obtained the present job without having attended the college. Only 40 per cent said that their present job was closely related to the education they acquired at college. Thirty-nine per cent believed that the community junior college education helped secure the first job after leaving college. One student in 4 said that he needed additional training to fulfill the job requirements, but only 29 per cent believed that it was difficult to keep up with new developments.

Twenty-three per cent were members of unions.

Approximately one-half of the students were well satisfied with their jobs, even though only 35 per cent were actually working at the kind of job prepared for while at the college.

Thirty-four per cent or 101 of the 297 respondents completed the curricula and graduated. The remainder of this section is devoted to the characteristics of these graduates.

More than three-fourths of the graduates started college between 17-20. Fourteen per cent had previously attended another college or university. Most had only average grades in high school. Savings and work provided the money for education for about one-half of the graduates. Most were enrolled continuously on a sequential program, but, nearly one-half took some part-time classes. Sixty-two per cent completed the curricula in 2 years. Grade averages of C characterized the efforts of nearly 60 per cent while in college although 40 per cent had B averages.

Seventeen per cent worked on full-time jobs and 66 per cent on part-time jobs while attending college.

The graduates expressed the opinion that most helpful of the courses were drafting and design, and technology while the least helpful were physical education and social science. A desire for additional courses in mathematics and leadership was identified. English and mathematics were selected as the courses most in need of revision to be geared to the needs of the technician. Most felt that courses were not too specific but 20 per cent thought the courses were too general. Twenty-two per cent said that too much emphasis was placed on theory. About one-half felt that time devoted to development of hand and machine skills needed to be increased. Sixty-eight per cent wanted to take more courses.

After graduation 77 per cent found full-time employment and 6 per cent part-time work. Forty per cent were employed on technician jobs. Seventy-two per cent found work in the home community or within 50 miles of the college. Information provided from the study indicated little difference in the median salary of the graduates as compared with the total respondents.

Four of each 10 believed they could have obtained their present job without attending the college. Only 53 per cent said that their present job was closely related to the education received; however, 60 per cent admitted that the education did help them secure the first job. Forty-five per cent were well satisfied with their jobs. About one-half said they were working at the kind of position they prepared for at college.

The possibility of advancement was indicated by the fact that 45 per cent believed that the education at college would help them move into "middle management" positions.

CHAPTER VII

RECOMMENDATIONS

Recommendations growing out of this study fall into two categories: first, considerations relative to the facts indicated by the study; second, general recommendations resulting from the performance and activities of the study.

Emphasis is placed on several areas by the facts of this study which suggest the following recommendations:

Education of instructors. The scope of industrial-technical curricula in the public community colleges of Michigan encompasses a significant number of students and instructors. A need for uniformly high standards of teacher qualifications must exist if quality instruction is to be provided for all. The facts of the study indicate considerable variation in the preparation of teachers as to formal education in pedagogy, and subject-matter content courses and, also, in actual, closely related work experience. If quality instruction is to be provided for all students in industrial-technical curricula, procedures must be developed that will insure instructors' proficiency in the three areas mentioned above. Since the scope of this study did not include the determination of minimum competencies essential for these instructors, the recommendation is in order that further studies be made to identify these characteristics. Related to this problem is the subject of how these instructors could best secure these competencies. The role of course work, teaching experience, and industrial experience in developing teaching proficiency at this level is worthy of additional exploration. Study of the merits of a cooperative work experience plan of teacher education may provide additional insight for the solution of this problem.

Selection and certification of instructors. The facts of the study introduced the question of the role of certification requirements in the selection of instructors. Adjusting certification requirements to increase teacher qualifications is one method of securing more competent teachers. This method is worthy of consideration. Another method of achieving the same objective is to adjust the standards of the accrediting associations to require higher teacher qualifications for the accreditation of the community junior colleges. In accordance with the findings of this study one or both of these approaches or some other effective method that would raise standards of teacher preparation is recommended. This recommendation includes careful review and analysis of teacher competencies including: (1) preparation in pedagogy, (2) subject-matter content courses in technical specialty, and (3) number of years of closely related work experience. Identification of the minimum standards in each of the above areas should result in steps to implement strengthening teacher competencies through additional closely related education or experience prior to and during the initial years of teaching. Careful evaluation of teachers entering the field and upgrading of teachers presently employed through arrangements with industrial firms for summer employment and also during the year for part-time employment through a controlled system of "externships" might be an effective solution.

Reevaluation of courses and curricula. Even though this study has revealed the characteristics of the curricula at this time, continuous examination and comparison is desirable. Each institution must view its courses and curricula from the point of view of the objectives established and the needs of the students and the prospective employers. Each institution needs to be continuously concerned about the effectiveness of its educational program, the strength of its guidance and its administrative services, as well as the total role of the institution as an instrument of education in achieving its identified objectives. It is recommended that each institution utilize a carefully planned follow-up study of graduates and drop-outs at intervals of three or five years as an aid in appraising its success. It is further recommended that each institution reexamine the course offerings from the point of view of the objectives of the institution. Cooperative efforts between institutions in the development of curricula are highly recommended. Each and every course selected as part of a curriculum needs to produce an impact on the total objectives of that particular curriculum.

These and other findings suggest merit in additional study, careful analysis, and evaluation of the objectives of the institution, course offerings, course content, and manpower needs within the communities.

Placement. While most of the students seemed quite well satisfied with the counseling and guidance functions as presently performed, many

expressed the opinion that the placement service needed to be improved. This would seem a meritorious suggestion. Such a service, carefully planned and efficiently operated, could be of tremendous help to the students and also to the institutions as an excellent medium of public relations.

High school quartile rank. Careful study and analysis of the relationships between the high school quartile rank and such factors as college grade point average, semester hours earned in college, and the quartile rank on the entrance test may result in a very useful guidance tool for predicting the chances of success of the students who wish to enroll in various programs of the industrial-technical curricula. It is strongly recommended that additional study be given to this instrument as a possible indicator of student potential success in college.

Other items. As a result of the findings and through the knowledge gained during the period of this study, the following actions are recommended:

1. A state wide study of vocational-technical education should be conducted every ten years under state sponsorship.

2. More attention should be given to the part-time student in programs of higher education. Courses and curricula should be provided during and after regular hours for part-time students on both occupational and college transfer curricula.

3. The community junior college is in a unique position to make a great contribution to the "war on poverty" and to participate in other

programs aimed at solutions of the manpower problem. It is recommended that community junior colleges assume this responsibility in a much greater degree than presently indicated.

4. The manpower needs in occupational areas are constantly changing. New job opportunities are developing requiring new combinations of skills and knowledges. The role of the community junior colleges needs to be expanded to provide more experimental programs to meet the needs of the local community.

5. The occupational curricula must be "geared" to meet the needs of the prospective employers as to scope and level of course offering. Need rather than status should be the criteria applied in the selection of courses and content of courses.

6. Further study is recommended to clarify the objectives that each community junior college can serve effectively. Some may be able to serve the needs of students in both occupational and transfer curricula; whereas, others can only effectively serve the college transfer student. Each institution has a responsibility to provide a high quality program in every offering provided. It is important that each college constantly evaluate its effectiveness in meeting the objectives identified. Responsibility also rests in this area on the agencies of authorization (when establishing the college) and upon accreditation agencies (when approving colleges) to realistically appraise the ability of each institution to achieve the objectives identified.

Strengthening the community junior college in occupational fields as well as in other fields will result in maximizing the contribution of a dynamic educational institution in a vital educational field during a significant period of the history of Michigan and the United States.

SELECTED BIBLIOGRAPHY

A. BOOKS

Arkin, Herbert, and Raymond R. Colton. Tables for Statisticians. New York: Barnes and Noble, Inc., 1950.

Barr, Arvil, Robert Davis, and Palmer Johnson. Educational Research and Appraisal. Chicago: J. B. Lippincott Co., 1953.

Bogue, Jesse Parker. The Community College. New York: McGraw-Hill Book Company, Inc., 1950.

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

Byram, Harold M., and Ralph Wenrich. Vocational Education and Practical Arts in the Community School. New York: The MacMillan Co., 1958.

Conant, James Bryant. Education in a Divided World. Cambridge: Harvard University Press, 1948.

Conant, James Bryant. The American High School Today. New York: McGraw-Hill Book Co., 1959.

Croxton, Frederick, and Dudley J. Cowden. Practical Business Statistics. New York: Prentice-Hall, Inc., 1948.

Dalton, Frank W. The Development of Industrial Education in Michigan. Ann Arbor: The Michigan Industrial Education Society, 1940.

Dickhoff, John S. Democracy's College -- Higher Education in the Local Community. New York: Harper Brothers, 1960.

Dixon, Wilfrid J., and Frank J. Massey, Jr. Introduction to Statistical Analysis. New York: McGraw-Hill Book Company, Inc., 1957.

Fern, George H. What is Vocational Education? Chicago: American Technical Society, 1945.

Giachino, J. W., and Ralph O. Gallington. Course Construction in Industrial Arts and Vocational Education. Chicago: American Technical Society, 1954.

Gleazer, Jr., Edmund J. American Junior Colleges. Washington: American Council on Education, 1960.

Good, Carter, and Douglas Scates. Methods of Research. New York: Appleton-Century-Crofts, Inc., 1954.

Hawkins, Layton S., Charles A. Prosser, and John O. Wright. Development of Vocational Education. Chicago: American Technical Society, 1951.

Henry, Nelson B. The Public Junior College -- The Fifty-fifth Yearbook of the National Society for the Study of Education. Chicago: The University of Chicago Press, 1956.

Henninger, G. Ross. The Technical Institute in America. New York: McGraw-Hill Book Co., Inc., 1959.

Hillway, Tyrus. The American Two-Year College. New York: Harper and Brothers, Publishers, 1953.

Howes, Raymond F. Higher Education and the Society It Serves. Washington: American Council on Education, 1957.

Keller, Franklin J. Principles of Vocational Education. Boston: D. C. Heath and Co., 1948.

Koos, Leonard V. The Questionnaire in Education. New York: The MacMillan Co., 1928.

Linquist, E. F. Statistical Analysis in Educational Research. Boston: Houghton Mifflin Company, 1940.

Mortorana, S. V. The Community College in Michigan. Staff Study Number 1 of the Survey of Higher Education in Michigan. Lansing: Michigan Legislative Study Committee on Higher Education, 1956.

Mays, Arthur B. Essentials of Industrial Education. New York: McGraw-Hill Book Company, Inc., 1952.

McCarthy, John A. Vocational Education: America's Greatest Resource. Chicago: American Technical Society, 1951.

McClellan, Grant S. America's Educational Needs. New York: H. W. Wilson Company, 1958.

Medsker, Leland L. The Junior College: Progress and Prospect. New York: McGraw-Hill Book Company, Inc., 1960.

Meeting Ohio's Needs for Vocational and Technical Education. Columbus: Ohio State University, The Ohio Trade and Industrial Education Service, 1957.

Melby, Ernest O., and Morton Puner. Freedom and Public Education. New York: Frederick A. Praeger, Inc., 1953.

National Manpower Council. A Policy for Scientific and Professional Manpower. New York: Columbia University Press, 1953.

National Manpower Council. A Policy for Skilled Manpower. New York: Columbia University Press, 1954.

Parten, Mildred. Surveys, Polls and Samples: Practical Procedures. New York: Harper and Bros., 1950.

Payne, Stanley L. The Art of Asking Questions. Princeton: Princeton University Press, 1951.

Quigley, Thomas H. In the Sweat of Thy Face. Atlanta: Turner E. Smith and Co., 1942.

Roberts, Roy W. Vocational and Practical Arts Education. New York: Harper and Brothers, Publishers, 1957.

Rummel, J. Francis. An Introduction to Research Procedures in Education. New York: Harper and Brothers, 1958.

Seashore, Carl Emil. The Junior College Movement. New York: E. Holt and Company, 1940.

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

Smith, Ralph J. Engineering as a Career. New York: McGraw-Hill Book Company, Inc., 1956.

Starrak, James A. and Raymond M. Hughes. The Community College in the United States. Ames: The Iowa State College Press, 1954.

Starrak, James A., and Raymond M. Hughes. The New Junior College the Next Step in Free Public Education. Ames: The Iowa State College Press, 1948.

Strang, Ruth. Counseling Technics in College and Secondary School. New York: Harper and Brothers, 1949.

Technician Education Yearbook, 1963-1964. Ann Arbor: Prakken Publications, Inc., 1963.

Thornton, Jr., James W. The Community Junior College. New York: John Wiley and Sons, Inc., 1960.

Travers, Robert M. An Introduction to Educational Research. New York: The MacMillan Company, 1958.

Walker, Helen M., and Joseph Lev. Statistical Inference. New York: Holt, Rinehart, and Winston, 1953.

Ward, Phebe. Terminal Education in the Junior College. New York: Harper and Brothers, 1947.

B. PUBLICATIONS OF THE GOVERNMENT, LEARNED SOCIETIES AND OTHER ORGANIZATIONS

American Council on Education. Wanted: 30,000 Instructors for Community Colleges. Washington: American Council on Education, 1949.

Atkinson, William N. Michigan Community Colleges. Jackson: Michigan Council of Community College Administrators, 1960.

Dwyer, William G. Report of A Study of General Education Programs in Community Junior Colleges. A study under the direction of Max Smith, Michigan State University. Middleton: Curriculum Commission of the American Association of Junior Colleges, 1960.

Emerson, Lynn A. Vocational-Technical Education for American Industry. Washington: United States Government Printing Office, 1958.

Foncannon, Howard F. Trends in the Employment and Training of Scientists and Engineers. National Science Foundation, Circular N3F-56-11. Washington: Government Printing Office, 1956.

Improving Vocational Education in Rhode Island. Providence: Rhode Island State Department of Education, 1950.

Manpower Challenge of the 1960's. Washington: Government Printing Office, 1960.

McLure, William P. Vocational and Technical Education in Illinois. Springfield: Office of the Superintendent of Public Instruction, 1960.

Michigan Council of Community College Administrators. Michigan Community Colleges. Jackson: Michigan Council of Community College Administrators, 1960.

National Association of Manufacturers. Your Opportunities in Industry. New York: National Association of Manufacturers, 1957.

Sampling Procedures and Tables for Inspection by Attributes, Military Standards. Washington: Government Printing Office, 1950.

Trade and Industrial Education Division, Office of Vocational Education, Department of Public Instruction. Recommendations for Trade and Industrial Education Service in Michigan Public Schools. Lansing: Department of Public Instruction, 1950.

United States Department of Labor. Employment Outlook in Skilled Electrical and Electronics Occupations. Washington: Superintendent of Documents, 1955.

Vocational Education Needs in Lane County. Eugene: Eugene School District, 1957.

Vocational-Technical Training for Industrial Occupations. Vocational Division Bulletin No. 228, Vocational-Technical Training Series No. 1. Report of the Consulting Committee on Vocational-Technical Training. Washington: U. S. Office of Education, 1944.

Wanty, Vernon. "Governor Williams Cites Junior Community Colleges Most Important Educational Development in 50 Years," M.A.J.C. Newsletter. April 1, 1960.

C. PERIODICALS

Armsby, Henry H. "Technological Team; Most Valuable National Resource," School Life, 37:58-9, January, 1955.

Cox, W. W., and W. D. Purvine, "How Oregon Trains Technicians," American Vocational Journal, 31:17-19, October, 1956.

Cummings, K. C. "Characteristics of the Technician as an Engineering Aide," Journal of Engineering Education, 47:443-449, January, 1957.

Emerson, Lynn. "What is Technician Training?" School Shop, 18:20-22, April, 1959.

Freund, C. J. "The Technician and the Engineer," Journal of Engineering Education, 44: 108-9, October, 1953.

Hortensteen, H. N. "What Happens to Technicians?" American Vocational Journal,32:31, April, 1957.

Hippaka, T. A. "Education for Peace," Industrial Arts and Vocational Education, 47:84-92, March, 1958.

Hubbard, Frank W. "Questionnaires," Review of Educational Research, 9:502, December, 1939.

MacCormac, Earl. "Industry Takes a Look at Industrial," American Vocational Journal, 33:22-23, February, 1958.

Nixon, John E. "The Mechanics of Questionnaire Construction," Journal of Educational Research, 47:481-87, March, 1954.

Sims, Ray. "It's Technicians, 5:1," The Texas Outlook, 41:21-22, October, 1957.

Williford, E. Allan. "Engineering Technician: His Role in Industry and National Defense," Journal of Engineering Education, 47:443-449, January, 1957.

D. UNPUBLISHED MATERIALS

Alpena Community College. Bulletin 1960-61. Alpena: Alpena Community College, 1960.

Bay City Junior College. Catalogue 1959-1961. Bay City: Bay City Junior College, 1959.

Burger, Jacob L., and Edmund N. Kogut. "Results of Graduate Survey, Flint Community Junior College, Department of Trades and Industry," Flint: Flint Community Junior College, 1959.

Community College and Technical Institute. General Information 1961-1963. Benton Harbor: Community College and Technical Institute, 1961.

Educational Program and Administrative Survey. A study of Flint Community Junior College. Chicago: Booz, Allen, Hamilton, 1961.

Flint Community Junior College. 1961-1962 Catalog. Flint: Flint Community Junior College, 1961.

Grand Rapids Junior College. 1961-1962 Catalog. Grand Rapids: Grand Rapids Junior College, 1961.

Henninger, G. Ross. "Functions of the Engineering Technician in Industry." Paper read at the American Society for Engineering Education, Detroit, Michigan, May 9, 1959.

Henry Ford Community College. General Information and Course Description. Dearborn: Henry Ford Community College, 1961.

Jackson Junior College. 1961-1962 Bulletin. Jackson: Jackson Junior College, 1961.

Kellogg Community College. Announcement 1961-62. Battle Creek: Kellogg Community College, 1961.

Kimball, John Robert. "Analysis of Institutional Objectives in Michigan Community College." Unpublished Doctor's thesis, Michigan State University, East Lansing, 1960.

Lansing Community College. Catalog Number 4, 1960-61. Lansing: Lansing Community College, 1960.

Lorion, James E. "A Follow-Up Study of Students Graduating from the Applied Science Curricula at Flint Community Junior College." Flint: Flint Community Junior College, April 24, 1961.

Muskegon Community College. Catalog 1961-62. Muskegon: Muskegon Community College, 1961.

Northwestern Michigan College. 1961-1962 Bulletin of Information. Traverse City: Northwestern Michigan College, 1961.

Port Huron Junior College, Catalogue 1961-1962. Port Huron: Port Huron Junior College, 1961.

Sherman, D. R. "Vocational-Terminal Education in the Public Community Colleges of Michigan: Its Present and Its Future." Detroit: Wayne State University, June, 1956. (Mimeographed summary)

South Macomb Community College. Announcement 1961-1963. Warren: South Macomb Community College, 1961.

DIRECTORY OF APPENDICES

Appendix A. The exact forms as used in the pilot study, which consisted of the letter of transmittal and the questionnaire, are included in this section.

Appendix B. The forms used in the actual follow-up study of the students are included in this appendix. This included the printed questionnaire, the mimeographed letter of transmittal, and three mimeographed follow-up letters used for this part of the study.

Appendix C. Analysis of the population giving the number and percentage of respondents for each of the stratified populations is given in this section.

Appendix D. Enrollment statistics of the community colleges in Michigan for the year 1959-1960 is contained in this table.

APPENDIX A

825 West Dartmouth
Flint 4, Michigan
December 2, 1961

This is an important study of industrial-technical education in the Michigan public community junior colleges. It is a part of a state-wide study of vocational education being conducted by the Michigan Vocational Education Evaluation Project as authorized by the legislature of the State of Michigan. This study has also been approved by Michigan State University and by Dr. Charles, Acting Dean of Flint Community Junior College.

You have been selected to participate in the initial pilot study. Please read and react to each item on the enclosed form as indicated. This will take about twenty minutes. Part of the purpose of this pilot study is to determine whether or not any of the items need improvement or refinement in the wording. As you proceed with the form please underline any word or words whose meaning is not clear and write in the margins any comments relative to the clearness of any of the items.

It is very important that you complete the enclosed form and return it as soon as possible. You need not sign your name. Your responses will be held completely confidential. While your identity will not be revealed, your responses will become part of the total response of those students who have been enrolled in industrial-technical curricula in the Michigan public community junior colleges.

If you wish results of the study should these be published, please check the space provided on the form.

An addressed envelope is enclosed for your convenience in returning the form within the next week. THIS IS IMPORTANT!

Sincerely yours,

Milton E. Larson

Enclosure

APPENDIX A

MICHIGAN STATE UNIVERSITY
College of Education
East Lansing, Michigan

PLEASE RETURN TO: MILTON E. LARSON
825 West Dartmouth
Flint 4, Michigan

A STUDY OF THE EDUCATIONAL AND OCCUPATIONAL EXPERIENCES OF STUDENTS IN THE INDUSTRIAL TECHNICAL PROGRAMS IN MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES

- - 0 - -

This study is part of a state wide study of vocational education approved by Michigan State University and authorized by the legislature of the State of Michigan. Your prompt cooperation in completing this form will assist in the evaluation of vocational education in the State of Michigan.

- - 0 - -

DIRECTIONS: Please respond to each item unless otherwise indicated by either filling in the blank provided or by checking the best response. Feel free to make comments in the margins or on the back of the sheet.

A. GENERAL INFORMATION

1. Community junior college attended ______________________________

2. Age at time of first enrollment at community junior college ____

3. Sex:
   __ A. Male
   __ B. Female

4. Marital status:
   __ A. Married prior to enrollment
   __ B. Married during attendance at college
   __ C. Married after graduation or termination of college career
   __ D. Unmarried
   __ E. Divorced

5. Residence while attending college:
   __ A. Resident of community junior college district
   __ B. Non-resident of community junior college district from Michigan
   __ C. Out-of-state non-resident of community college district
   __ D. Resident of community junior college district part of the time; non-resident part of the time

6. Have you previously been enrolled in another college or universit
   __ A. Yes If yes, give name of college ____________________
   __ B. No location of college ____________________

7. Title of program of study you pursued at the community junior college:
   __ A. Automotive technology
   __ B. Architectural technology
   __ C. Body drafting technology
   __ D. Chemical technology
   __ E. Civil technology
   __ F. Drafting technology
   __ G. Electrical technology
   __ H. Electronics technology
   __ I. Engineering technology
   __ J. Ind. management technology
   __ L. Mechanical technology
   __ M. Metallurgical technology
   __ O. Other ____________
   __ P. Changed curricula during time of enrollment. Describe: ____________

   ____

   ____

8. Your father's occupation at the time of enrollment at community junior college:
__ A. Unskilled labor -- manual labor
__ B. Semi-skilled labor -- "operatives"
__ C. Skilled labor -- skilled craftsmen
__ D. Professional
__ E. Business owner
__ F. Agricultural worker
__ G. Manager or executive
__ H. Clerk or sales work
__ I. Service work
__ J. Other occupation ______________________________
__ K. Father deceased
__ L. Father disabled
__ M. Other ______________________________

B. EDUCATIONAL EXPERIENCE

9. Number of semesters or quarters attended during which you took full-time college work:
__ A. One
__ B. Two
__ C. Three
__ D. Four
__ E. Five
__ F. Six
__ G. Seven
__ H. Eight
__ I. Nine
__ J. Other number __________

10. Number of semesters or quarters attended during which you took part-time college work:
__ A. One
__ B. Two
__ C. Three
__ D. Four
__ E. Five
__ F. Six
__ G. Seven
__ H. Eight
__ I. Nine
__ J. Other number

11. Total number of credit hours earned ______________________

12. Your enrollment was continuous during the regular school year (do not consider summer sessions) on a sequential program until graduation or termination:
__ A. Yes
__ B. No

13. Did you complete the full requirements of your curriculum in a two-year period?
__ A. Yes
__ B. No Number of years enrolled ______________________

14. Indicate the financial arrangement used for you education at the community junior college:
__ A. Borrowed money
__ B. Personal savings
__ C. Scholarship assistance
__ D. Financial assistance from parents
__ E. Financial assistance from others
__ F. Work
__ G. GI bill
__ H. Combination of A, B, and F above
__ I. Combination of D and F above
__ J. Other combination of above ______________________
__ K. Other ______________________________

15. If you were to make your occupational choice today would you:
__ A. Select the same one -- which is ______________________
__ B. Select a trade
__ C. Select a profession
__ D. Enter business
__ E. Enter agriculture
__ F. Other ______________________

16. Did you obtain adequate help from your junior college relative to:

YES	NO	UNCERTAIN	
__	__	__	A. Occupational choice
__	__	__	B. Orientation -- getting adjusted at college
__	__	__	C. Counseling on school problems
__	__	__	D. Counseling on personal problems
__	__	__	E. Job placement

17. As you consider your experience at the community junior college evaluate each item listed at the top of the table in relation to each of the course areas given at the left and check your responses. Leave areas blank from which you did not have any courses.

Course area (Consider the subjects of the area as part of the total program)	These courses were very helpful	These courses were NOT helpful	More of these would have helped me	These needed to be geared more to need of technicia
A. Architecture	__	__	__	__
B. Art	__	__	__	__
C. Business	__	__	__	__
D. Drafting & design . . .	__	__	__	__
E. Electricity	__	__	__	__
F. Electronics	__	__	__	__
G. Engineering	__	__	__	__
H. English	__	__	__	__
I. Leadership training . .	__	__	__	__
J. Mathematics	__	__	__	__
K. Physical Education . .	__	__	__	__
L. Physical Sciences . . .	__	__	__	__
M. Psychology	__	__	__	__
N. Social Sciences	__	__	__	__
O. Technology	__	__	__	__

18. Did you graduate from the community junior college in an industrial technical program?
__ A. Yes
(1) Year of graduation ______________________
(2) Exact name of degree earned ______________________
(3) Number of credits earned ______________________
(4) Title of program studied ______________________
__ B. No

- - - GRADUATES OF THE ABOVE JUNIOR COLLEGE PROGRAM WILL OMIT ITEMS 19 AND 20 ONLY -- PLEASE COMPLETE ALL OTHER PARTS - - -

- - 0 - -

19. If you have not graduated is it because you:
__ A. Are still attending the community junior college
__ B. Transferred to another college. Name of college ________
__ C. Accepted an apprenticeship. Name of trade ____________
__ D. Entered the military service. Branch ______________
__ E. Accepted a job. Name of job ____________________
__ F. Other ______________________________

20. If you terminated your education at the junior college without graduation, check the reason or reasons.
__ A. Financial
__ B. Personal
__ C. Family
__ D. Scholastic -- low grades
__ E. Courses too general; not specific enough for my goals
__ F. Courses too "deep"; too much like engineering courses
__ G. Learned what I wanted to; didn't plan to graduate
__ H. Combination of A, B, and C above
__ I. Combination of D, E, F, and G above
__ J. Combinations of above reasons ________________
__ K. High tuition
__ L. Other ______________________________

C. JOB EXPERIENCES (Complete this section only if you are now or have at some time since leaving community junior college been employed full-time.)

21. Are you employed:
__ A. At a job classified as a technician. If so, give the exact title of the job ________________
__ B. At unskilled labor -- manual labor
__ C. At a semi-skilled job -- as "operatives"
__ D. At a skilled job -- as a skilled craftsman
__ E. At a clerical or sales job
__ F. At a service job
__ G. As a farmer or farm worker
__ H. In a profession
__ I. Other ______________________________

22. Present employment location relative to location of community junior college attended:
__ A. Employed in the same community in which the college is located
__ B. Employed in a community other than that in which the college is located but within 50 miles of it
__ C. Employed in Michigan but in a community more than 50 miles from the college attended
__ D. Employed in a state other than Michigan. Name of state employed in ________________
__ E. Other ______________________________

23. Average weekly income from full-time employment:

A. On first job after leaving community junior college

__ (1) Less than \$60
__ (2) \$61 - \$74
__ (3) \$75 - \$89
__ (4) \$90 - \$104
__ (5) \$105- \$119
__ (6) \$120- \$134
__ (7) \$135- \$149
__ (8) \$150 and over

B. Now, on present position

__ (1) Less than \$60
__ (2) \$61 - \$74
__ (3) \$75 - \$89
__ (4) \$90 - \$104
__ (5) \$105- \$119
__ (6) \$120- \$134
__ (7) \$135- \$149
__ (8) \$150 and over

24. In what manner did you obtain your first job after leaving the community junior college?
__ A. School placement
__ B. Friends and relatives
__ C. My own efforts -- ads, letters, etc.
__ D. Employment agency
__ E. Other ______________________________

25. Have you drawn unemployment compensation since leaving the community junior college?
__ A. Yes For ____________ number of weeks.
__ B. No

26. Indicate your reaction to the following. Feel free to make comments using the back side of this page if necessary.

	YES	NO	DON'T KNOW	COMMENTS
A. Could you have obtained your current position without attending the community junior college?	__	__	__	________
B. Is your present job related in some manner to the training you had at the community junior college?	__	__	__	________
C. Did your training at the community junior college aid you in getting your first job?	__	__	__	________
D. Did your employer require additional training in order to fulfill the job requirements?	__	__	__	________
E. Was the college environment conducive to education?	__	__	__	________

	YES	NO	DON'T KNOW	COMMENTS
F. Were most of the courses too general?	___	___	___	____________
G. Were most of the courses too specific?	___	___	___	____________
H. Was the total program of study too short?	___	___	___	____________
I. Was the total program of study too long?	___	___	___	____________
J. Was too much emphasis placed on theory and not enough on practical applications?	___	___	___	____________
K. Was too much emphasis placed on practical applications and not enough on theory?	___	___	___	____________
L. Should the amount of time devoted to developing skill be increased?	___	___	___	____________
M. Is it hard to keep up with new developments in your field?	___	___	___	____________
N. Are you a member of a union?	___	___	___	____________
O. Are you satisfied with your job?	___	___	___	____________
P. Are you working at the kind of job you prepared for while in the community junior college?	___	___	___	____________

27. List any suggestions you may have for the improvement of:

A. Individual courses of the program enrolled in

B. The total educational program you participated in at the community junior college

28. Complete either A or B below but not both.

A. If you did not graduate what are your present plans relative to education?

B. If you did graduate do you have plans for further education? Describe briefly.

29. Look ahead five years.

A. What job will you be definitely qualified for, if at all possible?

B. What job do you really think you will have?

30. Feel free to make any other suggestions or comments relative to industrial technical education in the community junior college or relative to your job experiences which will be helpful in evaluating and in making suggestions for improvement of the courses or of the total program.

31. Do you wish to receive a copy of the summary of this study, if one is made available?
__ A. Yes
__ B. No

Code __________

APPENDIX B

Schedule No.____________

(1-3)

MICHIGAN STATE UNIVERSITY
College of Education
East Lansing, Michigan

PLEASE RETURN TO: MILTON E. LARSON
825 West Dartmouth
Flint 4, Michigan

A STUDY OF THE EDUCATIONAL AND OCCUPATIONAL EXPERIENCES OF STUDENTS IN THE INDUSTRIAL TECHNICAL PROGRAMS IN MICHIGAN PUBLIC COMMUNITY JUNIOR COLLEGES

This study is a very significant part of a statewide study of vocational education approved by your community junior college and authorized by the legislature of the State of Michigan. Your prompt coöperation in completing this form is very important to vocational education in Michigan. YOU WILL MAKE AN IMPORTANT CONTRIBUTION BY COMPLETING AND MAILING THIS FORM TODAY OR AS SOON AS POSSIBLE!

DIRECTIONS: *Please respond to each item by checking your response or writing in the answer, unless otherwise indicated. Disregard the numbering system which is for tabulating purposes.*

A—GENERAL INFORMATION

4—Community junior college attended

____

5-6—Age at time of first enrollment at community junior college______

7—Sex:
- ☐ 1—Male
- ☐ 2—Female

8—Marital Status:
- ☐ 1—Single
- ☐ 2—Married prior to enrollment
- ☐ 3—Married during attendance at college
- ☐ 4—Married after graduation or termination of college
- ☐ 5—Widowed
- ☐ 6—Divorced

9—Residence while attending college:
- ☐ 1—Resident of community junior college district
- ☐ 2—Non-resident of community junior college district but from Michigan
- ☐ 3—Out-of-state non-resident of community college district
- ☐ 4—Resident of community junior college district part of the time, non-resident part of the time

10—Had you previously been enrolled in another college or university?
- ☐ 1—Yes
  If yes, give name of college
  ____
  Location of college
  ____
- ☐ 2—No

11-12—Title of program of study you pursued at the community junior college: (check title used by college as closely as possible)
- ☐ 01—Automotive technology
- ☐ 02—Architectural technology
- ☐ 03—Body drafting technology
- ☐ 04—Chemical technology
- ☐ 05—Civil technology
- ☐ 06—Drafting technology
- ☐ 07—Electrical technology
- ☐ 08—Electronics technology
- ☐ 09—Engineering technology
- ☐ 10—Industrial management technology
- ☐ 11—Industrial technology
- ☐ 12—Mechanical technology
- ☐ 13—Metallurgical technology
- ☐ 14—Other____________
- ☐ 15—Changed curriculum during time of enrollment. Describe:
  ____

13—Your father's occupation at the time of enrollment at community junior college:
- ☐ 0—Unskilled labor—manual labor
- ☐ 1—Semi-skilled labor—"operative"
- ☐ 2—Skilled labor—skilled craftsman
- ☐ 3—Professional
- ☐ 4—Business owner
- ☐ 5—Agricultural worker
- ☐ 6—Manager or executive
- ☐ 7—Clerk or sales worker
- ☐ 8—Service worker
- ☐ 9—Other occupation____________
- ☐ X—Other as father deceased or disabled
  ____

B—EDUCATION EXPERIENCE
(Give approximate if exact not available)

14—Average grade in high school

A (1) ☐ B (2) ☐ C (3) ☐ D (4) ☐ E (5) ☐

15—Average grade in community junior college

A (1) ☐ B (2) ☐ C (3) ☐ D (4) ☐ E (5) ☐

16—Number of semesters attended during which you took full-time college work: (If college is on quarter system indicate the number attended and check this box—quarter system ☐)

☐ 0—None	☐ 5—Five
☐ 1—One	☐ 6—Six
☐ 2—Two	☐ 7—Seven
☐ 3—Three	☐ 8—Eight
☐ 4—Four	☐ 9—Nine
☐ X—Other____________	
☐ ____________	

17—Number of semesters attended during which you took part-time college work (if college is on quarter system indicate the number attended and check this box—quarter system ☐)

☐ 0—None
☐ 1—One
☐ 2—Two
☐ 3—Three
☐ 4—Four
☐ 5—Five
☐ 6—Six
☐ 7—Seven
☐ 8—Eight
☐ 9—Nine
☐ X—Other________

18—Total number of semester hours earned in community junior college (if college is on quarter system indicate the number earned and then check "quarter hours" ☐)

☐ 0— 0-12
☐ 1—13-24
☐ 2—25-36
☐ 3—37-48
☐ 4—49-60
☐ 5—61-72
☐ 6—73-84
☐ 7—85-96
☐ 8— 97-108
☐ 9—109-120
☐ X—121 and over

19—Was your enrollment continuous during the regular school year (do not consider summer sessions) on a sequential program until graduation or termination?

☐ 1—Yes
☐ 2—No

20—Did you complete the full requirements of your curriculum in a two-year period?

☐ 1—Yes
☐ 2—No

21—Number of school years enrolled on this program at the community junior college________

22—Indicate the financial arrangement which most nearly describes your case for obtaining your education at the community junior college:

☐ 1—Personal saving
☐ 2—Scholarship assistance
☐ 3—Financial assistance from parents
☐ 4—Financial assistance from others
☐ 5—Borrowed money
☐ 6—Work
☐ 7—GI bill
☐ 8—Other________________________

23—If you were to make your occupational choice today would you:

☐ 1—Select the same one—which is__________
☐ 2—Select a trade—which one__________
☐ 3—Select a profession—which one________
☐ 4—Enter business
☐ 5—Enter agriculture
☐ 6—Other________________________

Did you obtain adequate help from your community junior college relative to the following items given below. Rate by checking either EXCELLENT, GOOD, FAIR, POOR, or VERY POOR for items 24 to 28.

	(1)	(2)	(3)	(4)	(5)
24—Making an occupational choice	☐Excellent	☐Good	☐Fair	☐Poor	☐Very Poor
25—Getting adjusted at college	☐Excellent	☐Good	☐Fair	☐Poor	☐Very Poor
26—Counseling on school problems	☐Excellent	☐Good	☐Fair	☐Poor	☐Very Poor
27—Counseling on personal problems	☐Excellent	☐Good	☐Fair	☐Poor	☐Very Poor
28—Obtaining a job	☐Excellent	☐Good	☐Fair	☐Poor	☐Very Poor

As you consider your experience at the community junior college evaluate each course area at the left in terms of the statement listed at the top of the table. Check as many as apply in each group.

Course Area (consider the subjects of the area as part of the total program)	(1) These Courses Were Very Helpful	(2) These Courses Were NOT Very Helpful	(3) More of These Would Have Helped Me	(4) These Needed To Be Geared More to the Need of Technicians
29—Architecture	☐	☐	☐	☐
30—Art	☐	☐	☐	☐
31—Business	☐	☐	☐	☐
32—Drafting and design	☐	☐	☐	☐
33—Electricity	☐	☐	☐	☐
34—Electronics	☐	☐	☐	☐
35—Engineering	☐	☐	☐	☐
36—English	☐	☐	☐	☐
37—Leadership training	☐	☐	☐	☐
38—Mathematics	☐	☐	☐	☐
39—Physical education	☐	☐	☐	☐
40—Physical sciences	☐	☐	☐	☐
41—Psychology	☐	☐	☐	☐
42—Social sciences	☐	☐	☐	☐
43—Technology	☐	☐	☐	☐

44—Did you graduate from the community junior college in an industrial-technical program?

☐ 1—Yes Year of graduation__________
Exact name of degree earned
____
Number of credits earned_____
(check if quarter hours ☐)

☐ 2—No Title of program studied
____

45—Do you plan to take more college courses in technical subjects or in any of the related fields?

☐ 1—Yes
☐ 2—No
☐ 3—Don't know or still uncertain

Graduates of a community junior college program will omit items No. 46 and 47 only— Please Complete All Other Parts

46—If you have not graduated is it because you:

☐ 1—Are still attending the community junior college
☐ 2—Transferred to another college
College name__________________
☐ 3—Accepted an apprenticeship
Name of trade_________________
☐ 4—Entered military service
☐ 5—Accepted a job or continued on a job previously held
☐ 6—Other____________________

47—If you terminated your education at the community junior college without graduation, check the main reason given below. While several of the reasons below may apply, check *only* the *most* significant *one.*

☐ 0—Financial—lack of available funds
☐ 1—High tuition at community junior college attended
☐ 2—Personal
☐ 3—Occupational goal uncertain—not sure of kind of work wanted
☐ 4—Family
☐ 5—Scholastic—low grades
☐ 6—Courses too general; not specific enough for my goals
☐ 7—Courses too "deep"; too much like engineering courses
☐ 8—Learned what I wanted to; didn't plan to graduate
☐ 9—Attending or attended another college
☐ X—Other____________________

C—JOB EXPERIENCES (complete this section if you are now or at some time since leaving the community junior college have been employed on a full- or a part-time job. If you have had more than one job consider *only* present employment)

48—Are you now:

☐ 1—Employed full time by others
☐ 2—Employed part time by others
☐ 3—Self employed
☐ 4—Unemployed

49—Are you employed:

☐ 0—At a job classified as a technician. If so, give the exact title of job
____
☐ 1—At unskilled labor—manual labor
☐ 2—At a semi-skilled job—as "an operative"
☐ 3—At a skilled job—as a skilled craftsman
☐ 4—At a clerical or sales job
☐ 5—At a service job
☐ 6—As a farmer or farm worker
☐ 7—In a profession What profession?
____
☐ 8—As a foreman or "first-line" supervisor
____
☐ 9—On a "middle management" job
☐ X—Other____________________

50—Present employment location relative to location of community junior college attended:

☐ 1—Employed in the same community in which the college is located
☐ 2—Employed in a community other than that in which the college is located but in Michigan within 50 miles of the college
☐ 3—Employed in Michigan but in a community more than 50 miles from the college attended
☐ 4—Employed in a state other than Michigan.
State____________________
☐ 5—Other____________________

Average weekly income from employment: (check only one item in each of 51, 52, 53, 54, 55, and 56 given below)

While Attending College—

51—☐ 1—Part-time job
☐ 2—Full-time job
☐ 3—No job

54—☐ 0—Less than $10 a week
☐ 1—$10-$14
☐ 2—$15-$19
☐ 3—$20-$24
☐ 4—$25-$29
☐ 5—$30-$34
☐ 6—$35-$39
☐ 7—$40-$44
☐ 8—$45-$49
☐ $50 and over

On First Job After College—

52—☐ 1—Part-time job
☐ 2—Full-time job

55—☐ 0—Less than $60 a week
☐ 1—$ 60-$ 74
☐ 2—$ 75-$ 89
☐ 3—$ 90-$104
☐ 4—$105-$119
☐ 5—$120-$134
☐ 6—$135-$149
☐ 7—$150-$164
☐ 8—$165-$179
☐ 9—$180 and over

On Present or Most Recent Job—

53—☐ 1—Part-time job
☐ 2—Full-time job

56—☐ 0—Less than $60 a week
☐ 1—$ 60-$ 74
☐ 2—$ 75-$ 89
☐ 3—$ 90-$104
☐ 4—$105-$119
☐ 5—$120-$134
☐ 6—$135-$149
☐ 7—$150-$164
☐ 8—$165-$179
☐ 9—$180 and over

57—In what manner did you obtain your first job after leaving the community junior college?

☐ 1—College placement service
☐ 2—Friends and relatives
☐ 3—My own efforts—ads, letters, etc.
☐ 4—Employment agency
☐ 5—Had job when enrolled
☐ 6—Other__________

58—Have you drawn unemployment compensation since leaving the community junior college?

☐ 1—Yes For____(number of) weeks
☐ 2—No

Indicate your reaction to the following.

	(1) YES	(2) NO	(3) DON'T KNOW (uncertain)
59—Could you have obtained your present job without attending the community junior college?	☐	☐	☐
60—Is your present job *closely* related to the education you received at the community junior college?	☐	☐	☐
61—Did your education at the community junior college aid you in getting your first job after leaving college?	☐	☐	☐
62—Did your first employer require additional training in order to fulfill job requirements?	☐	☐	☐
63—On the whole were the college facilities and classroom activities conducive to studying and learning?	☐	☐	☐
64—Were the majority of courses too general?	☐	☐	☐
65—Were the majority of courses too specific?	☐	☐	☐
66—Was the total program of study too short?	☐	☐	☐
67—Was the total program of study too long?	☐	☐	☐
68—Was too much emphasis placed on theory and not enough on practical applications?	☐	☐	☐
69—Was too much emphasis placed on practical applications and not enough on theory?	☐	☐	☐
70—Should amount of time devoted to developing hand or machine skills be increased?	☐	☐	☐
71—Is it hard to keep up with new developments in your field?	☐	☐	☐
72—Are you a member of a union? (Check if an apprentice union member ☐)	☐	☐	☐
73—Are you well satisfied with your job?	☐	☐	☐
72—Are you working at the kind of job you prepared for while in the community junior college?	☐	☐	☐
75—Has the employer provided for you a company training program?	☐	☐	☐
76—Do you think the community college courses you took will help you secure a position in "middle management" if you so desire?	☐	☐	☐

D—Present employer: Name__________

Street Address__________

City and State __________

E—Please feel free to make any other suggesions or comments concerning your community junior college educational experience or your later job experience which will be helpful in making improvements.

F—Do you wish to receive a copy of the summary of this study, if one is made available? ☐ Yes

2-5-62

APPENDIX B

825 West Dartmouth
Flint 4, Michigan
February 28, 1962

You are asked to co-operate with your local community junior college and with the Michigan Vocational Education Evaluation Project by participating in a study which will benefit not only your local community junior college and its students and their future employers, but will help the State of Michigan as a whole!

The chief official of your community junior college has endorsed this study and given it his whole-hearted support. This study is part of a state-wide study of vocational education being conducted by the Michigan Vocational Education Evaluation Project as authorized by the legislature of the State of Michigan. Michigan State University is helping to sponsor the study.

Please fill out the enclosed form and return it as soon as possible. This will take only about fifteen minutes and you will be rendering an important service to education. You need not sign your name. Your responses will be held completely confidential. While your identity will not be revealed, your responses will become part of the total reaction of those students who have been enrolled in industrial-technical curricula in the Michigan public community junior colleges.

If you wish results of the study should these be published, just check the space provided.

PLEASE DO YOUR PART IN HELPING US TO OBTAIN A 100% RESPONSE! An addressed, stamped envelope is enclosed for your convenience in returning the form. To tabulate the response and complete this state-wide study within the time allocated means that we should start tabulating the responses by March 10, 1962. We need your response -- HELP EDUCATION BY COMPLETING AND MAILING THE FORM AS SOON AS POSSIBLE!

Sincerely yours,

Milton E. Larson

Milton E. Larson
Michigan Vocational Education
Evaluation Project

Enclosure

APPENDIX B

825 West Dartmouth
Flint 4, Michigan
March 23, 1962

Alumnus of Industrial-Technical Curriculum
Public Community Junior Colleges
State of Michigan

Dear Alumnus:

A few weeks ago you were mailed a form which is very important to all industrial-technical education in Michigan! With that form was a letter explaining the fact that this is part of the state-wide Michigan Vocational Education Evaluation Project.

While the response has been quite gratifying, I would like to include your response together with the others in the final tabulation. If you attended the community junior college studying an industrial-technical curriculum during the school year 1958-59, you can make a real contribution by completing and mailing the form to me. YOUR RESPONSE IS VERY IMPORTANT! This is true whether you:

1. Graduated or took only one course.
2. Terminated before completing the semester or completed it.
3. Failed the courses or graduated with honors.

THIS IS YOUR CHANCE TO SPEAK YOUR MIND! We are asking you to do this because YOU are the only one who can give some of the information we are asking for. This is your opportunity to be of service as a responsible citizen of Michigan.

If your return is already in the mail accept our gratitude. Should the previous form have been lost or mislaid an additional copy is enclosed.

PLEASE COMPLETE AND RETURN THIS FORM IN THE ENCLOSED STAMPED ENVELOPE TODAY! The Michigan Vocational Education Evaluation Project is depending upon you. Fifteen minutes of your time used now -- TO COMPLETE THE FORM -- may be worth many dollars to future students, taxpayers, industry, and the whole state of Michigan. DO YOUR BIT -- NOW!

Sincerely yours,

Milton E. Larson

Milton E. Larson
Michigan Vocational Education
Evaluation Project

Enclosures

APPENDIX B

825 West Dartmouth
Flint 4, Michigan
April 7, 1962

Alumnus of Industrial-Technical Curriculum
Public Community Junior Colleges
State of Michigan

Dear Alumnus:

The report of the state-wide Michigan Vocational Education Evaluation Project must soon be made! For this study to be most effective requires a very high percentage of returns. You will recall the complete details of this study were given in the two previous letters mailed to you. I do hope you received them.

THIS STUDY IS IMPORTANT -- DO NOT DELAY COMPLETING THIS RETURN!

We want your returned form whether or not you:

1. Were disgusted and unhappy with your community college experience, or highly elated over it.

2. Graduated or took only one course.

3. Terminated before completing even one semester or finished many semesters.

4. Failed every course or made the Dean's Honor Roll.

5. Want improvement in vocational education or are very happy with it as it is.

IF SOME QUESTIONS ARE TOO PERSONAL FOR YOU -- OMIT THEM -- BUT DO RETURN THE FORM IN THE ENVELOPE PROVIDED WITH AS MANY OF THE ITEMS ANSWERED AS YOU ARE WILLING TO ANSWER TO HELP IMPROVE OUR EDUCATION!

I know you are not a slacker! Good citizens respond to the needs of their community. Give fifteen minutes of your time -- we are asking nothing more -- COMPLETE AND MAIL THE FORM NOW. I hope we can count you among those who are willing to help -- MICHIGAN EDUCATION MUST HAVE HELPED YOU! WAIT NO LONGER -- please complete and mail the form today.

Sincerely yours,

Milton E. Larson

Milton E. Larson
Michigan Vocational Education
Evaluation Project

Enclosures

825 West Dartmouth
Flint 4, Michigan
April 21, 1962

Alumnus of Industrial-Technical Curriculum
Public Community Junior Colleges
State of Michigan

Dear Alumnus:

May 1 is the final dead-line for including questionnaires received as response to the Michigan Vocational Education Evaluation Project. If you have not as yet mailed your form please do so immediately so that I may have it by May 1.

If you have already mailed the form accept our "Thank you" for assisting in this worthy effort.

As you will recall this questionnaire form is useful to the study even though you may have:

1. Graduated or taken only one course.

2. Failed every course or received "A's" in all.

3. Had a happy experience or are still "fighting angry" at everyone connected with the college.

4. Started and did not earn a single credit — if you only spent a day in this college, I would like you to COMPLETE THOSE QUESTIONS WHICH YOU FEEL APPLY and mail it back to me.

WILL YOU HONOR THE STUDY WITH YOUR EFFORTS AND RESPONSE -- IF SO, PLEASE RETURN THE FORM TODAY, COMPLETED!

Sincerely yours,

Milton E. Larson

Milton E. Larson
Michigan Vocational Education
Evaluation Project

Enclosure

APPENDIX C

NUMBER AND PERCENTAGE OF RESPONDENTS FOR EACH OF THE STRATIFIED POPULATIONS

Number code of stratified population	Number of students in population	Number who could not be contacted	Non-respondents in the armed forces	Total returns received	Returns as a percentage of the total
2	9	0	0	9	100
5	96	4	2	67	69.7
6	119	6	4	93	78.1*
7	39	2	1	25	64.1**
8	31	0	0	20	64.5
9	68	7	1	43	63.2***
10	26	2	2	20	76.9
11	24	0	0	20	63.3
Totals	412	21	10	297	72.0

NOTE: * Responses of two additional respondents received too late to tabulate with the group.

** Responses of one additional respondent received too late to tabulate with the group.

*** Responses of two additional respondents received too late to tabulate with the group.

APPENDIX D

MICHIGAN COMMUNITY COLLEGE FACTS FOR THE YEAR 1959-60 FROM REPORTS TO SUPERINTENDENT OF PUBLIC INSTRUCTION

Location of community college	Year estab-lished	Total number enrolled	Equated full-time college-credit	Per capita operating cost	Resident tuition per year	Non-resident tuition per year
Alpena	1952	276	236	642.30	130	200
Battle Creek	1956	819	500	502.79	150	200
Bay City - Delta	1922	2,162	1,415	450.54	170	260
Benton Harbor	1946	594	438	565.30	150	250
Dearborn	1938	5,820	2,824	492.59	150	300
Flint	1923	4,144	2,921	772.78	170	250
Grand Rapids	1914	2,294	1,774	540.53	160	220
Highland Park	1918	1,770	1,607	478.20	000	200
Ironwood	1932	145	157	632.90	144	192
Jackson	1928	1,095	863	528.67	200	300
Lansing	1957	857	551	549.02	200	275
Muskegon	1926	1,444	953	439.00	200	275
Petoskey	1958	168	108	529.31	196	246
Port Huron	1923	1,165	863	429.52	130	220
South Macomb	1953	1,233	747	243.57	90	180
Traverse City	1951	606	415	553.60	252	277

[77] William N. Atkinson, Michigan Community Colleges (Jackson: Michigan Council of Community College Administrators, 1960), pp. 2-6.