

FACTORS WHICH DETERMINE THE INFLUENCE OF
INDUSTRIAL ARTS ENROLLMENT ON OTHER
VOCATIONAL EDUCATION
PROGRAMS

By

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Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
May, 1986

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May, 1986

ACKNOWLEDGMENTS

I would like to express my appreciation to the members of my advisory committee, Dr Clyde Knight, Dr Kenneth St Clair, Dr Don Frazier, and particularly Dr Craig Anderson, who was my thesis adviser

My appreciation also goes to Dr Roger Stacy, the Oklahoma State Supervisor for Industrial Arts/Technology Education, for his help, suggestions, and encouragement when this study was just an idea

I appreciate the help given me by the administrators, teachers, and students who helped me with the survey at each of the eight schools. Those schools were Guymon High School, Holdenville High School, Kingfisher High School, Eastern Oklahoma County Area Vocational-Technical School, Choctaw, Kiamichi Area Vocational-Technical School, McAlester, Tulsa County Area Vocational-Technical School, Memorial Campus, and Western Oklahoma Area Vocational-Technical School, Burns Flat. I would be remiss if I did not express my appreciation to Caddo-Kiowa Area Vocational-Technical School and Apache High School for allowing me to field test the survey instrument with their students. The cooperation from each of the schools and their willingness to help so near the end of the school year will long be remembered.

Without the support and encouragement of my family and friends, this study may never have been completed.

To each of them, "Thank you "

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CHAPTER I

INTRODUCTION

For most of the last century, some form of industrial arts has been a part of the curriculum of many schools in the United States. Although begun as a part of general education, industrial arts, or manual training as it was first known, has developed through several name changes, as well as changes in its purposes (Barlow, 1967).

Industrial arts became eligible for federal reimbursement in 1973 as the result of Public Law 92-318, The Education Amendments to the Vocational Education Act of 1963. In order to receive funding, a state and its industrial arts program had to meet certain requirements. One requirement has been the inclusion of industrial arts in the State Plan for Vocational Education. The State Plan for Vocational Education includes the organization, the goals, and the objectives of all the programs that are a part of vocational education in the state. The State Plan, which must be revised annually, is a contract between the state and the U. S. Department of Education. Another requirement of the law was that the industrial arts courses which received federal funding would be exploratory in nature (Steeb, 1979). Those guidelines exist today as a requirement for reimbursement as a part of the Carl Perkins Vocational Education Act (Public Law 98-524). The exploratory industrial arts courses are ones that allow students, both male and

female, to explore industry, what it is, what it does, and how it functions (Scobey, 1968)

In 1904 the term "industrial arts" was used for courses that had previously been called "manual training" or "manual arts" Thirteen years later the Smith-Hughes Act of 1917 provided federal funds for vocational education The vocational education sections of the Smith-Hughes Act included vocational agriculture, home economics, and trade and industrial education (Barlow, 1967) As it exists today, trade and industrial education is a result of its development since the passage of the Smith-Hughes Act and the Vocational Education Act of 1963 (Calhoun & Finch, 1982)

Trade and industrial education is that education intended to give a person job entry skills for a job, in a trade or industry, of less than a baccalaureate level (Section 8, Vocational Education Act of 1963)

In Oklahoma, trade and industrial programs are available in area vocational-technical schools and in several comprehensive high schools The students in trade and industrial programs in area vocational-technical schools are juniors and seniors in high school, and adults, if space is available The students in trade and industrial programs in comprehensive high schools are primarily junior and seniors, but may be sophomores also Most trade and industrial programs are three hours per day, or one-half day, for two years, or four semesters, for high school students The remaining half of their school day, the students study math, English, science, history, and other subjects required for graduation from high school (Public Information Office, 1983)

At the present time in Oklahoma, industrial arts is generally accepted as an exploratory course Industrial arts has had several concurrent purposes Among them have been exploratory, general education,

guidance, prevocational, avocational, and even vocational (State Industrial Arts Curriculum Committee & State Supervisor of Industrial Arts, 1979)

Exploratory industrial arts includes industrial arts/technology education, as fifty newly-funded programs in Oklahoma have been named. These fifty programs comprise the first group of programs organized and developed as premier programs in industrial arts/technology education to meet the requirements of the Vocational Education Act. These programs encompass four clusters: communication, manufacturing, construction, and transportation which includes power and energy. The curriculum materials for the fifty programs include information concerning employment possibilities within each of the cluster areas. Thus, students should know about many of the jobs available in each area (Stacy, 1985). Also, since industrial arts includes psychomotor experiences as well as cognitive information, the students completing those exploratory programs will have begun to formulate opinions on whether they would like working in any of the jobs in a given cluster (State Industrial Arts Curriculum Committee & State Supervisor of Industrial Arts, 1979)

Because of the cost of training students and the limited number of openings for students in many programs, it is important that those students in trade and industrial programs be the ones who want to complete the program, i.e. stay in the program for both years (Simmons, 1979). There are students in trade and industrial classes who do not stay in the program for the entire two years. Some of the students decide before the end of the first semester of their first year that they do not like the program. Others decide by the end of the first year that they should not continue in the program the second year.

Some of the students who choose to discontinue the program do so because of schedule conflicts and graduation requirements, but many drop out because they dislike the program (Hopper, 1984)

Statement of the Problem

Educators need more information to help them determine whether industrial arts experiences influence students in their choices of trade and industrial programs and in their decisions to enroll in the second year of a two-year program

Purpose of the Study

The purpose of this study is to determine whether industrial arts experiences influence high school students as they decide to enroll in trade and industrial programs for the first year. A second question is whether fewer of the students who plan not to take the second year of the two year program have had an industrial arts course than have not

Objectives

There were two major objectives to be accomplished in this study

- 1 The first objective was to determine the association between a student's taking an industrial arts course and his or her decision to enroll in a particular trade and industrial program during the later years of the high school experience

- 2 The second objective was to determine the difference in plans for enrolling in the second year of two-year trade and industrial programs of those students who have had an industrial arts course prior

to enrolling in the trade and industrial program and of those students who have not had an industrial arts course

In addition to those two objectives, there are four questions which must be answered to discover some of the factors which influence the association and/or difference

A Did the results of the research vary by the type of industrial arts course (general industrial arts, woods, metals, drafting, or other) in which the student was enrolled?

B Did the results of the research vary by the size of the home high school, small, medium, or large?

C Did the results of the research vary by the sex of the student?

D Did the results of the research vary by whether the trade and industrial program was offered at the home high school or at the area vocational-technical school?

Limitations

This study was limited to those high school students enrolled in trade and industrial programs in comprehensive high schools and area vocational-technical schools in the state of Oklahoma. Some 20 students were excluded from the study because their home high schools had dismissed for the summer or because they were not in school on the days that other students completed their questionnaires. Another 30 students were in classes that left the campus to work on projects at the time. All students were within the last three weeks of the end of the school year. Those students surveyed were enrolled in trade and industrial programs in four comprehensive high schools and four area vocational-technical schools and were selected to be demographically representative.

of trade and industrial education students in Oklahoma

Assumptions

These are the assumptions for this survey

1 The students and programs involved in the study are representative of students and programs in other comprehensive high schools and area vocational-technical schools in the state

2 The students answered the questions honestly and to the best of their ability

3 The students had been advised and counseled about courses they needed to take for graduation from high school and had decided whether they would continue the trade and industrial education program if all the courses they wanted to take could be incorporated into their schedules

4 The students knew whether they had had an industrial arts course rather than another course such as a vocational agriculture welding course or a Coordinated Vocational Education and Training (CVET) course

Definition of Terms

Area vocational-technical school A school established in a vocational-technical school district which usually has been formed by the uniting of several school districts in order to offer students a wider choice of vocational programs

Comprehensive high school A high school which offers all types of courses and programs, college preparatory as well as vocational, general as well as specialized

Home high school The high school where the student is regularly enrolled and which gives credit toward graduation for vocational courses

as well as general education courses even though the course may have been taken at an area vocational-technical school

Industrial arts A program of classroom and laboratory experiences which provide students with a basic education in the industrial and technological aspects of society. Industrial arts programs allow students to experiment, design, construct, and evaluate. Students use tools, machines, materials, and processes which, in addition to developing an understanding of industry and technology, assist students in making informed and meaningful occupational choices. Students can also prepare for entry into advanced trade and industrial or technical education programs (Oklahoma State Department of Vocational and Technical Education, 1985)

Size of high school The classification of a high school based on the average daily enrollment in grade nine through twelve for the 1984-85 school year, as reported in the September, 1985, bulletin of the Oklahoma Secondary School Activities Association. The 64 largest schools are classified as large, the next 136 schools are considered medium-sized, the remaining 291 schools are ranked smaller than the high school in Oklahoma ranked two hundredth in size (see Figure 1)

Trade and industrial education A vocational program intended to give high school students, and adults in some schools, entry level skills and knowledge in a trade to enable them to be employed in the trade upon graduation or program completion. Trade and industrial courses may be available to students at area vocational-technical schools or comprehensive high schools

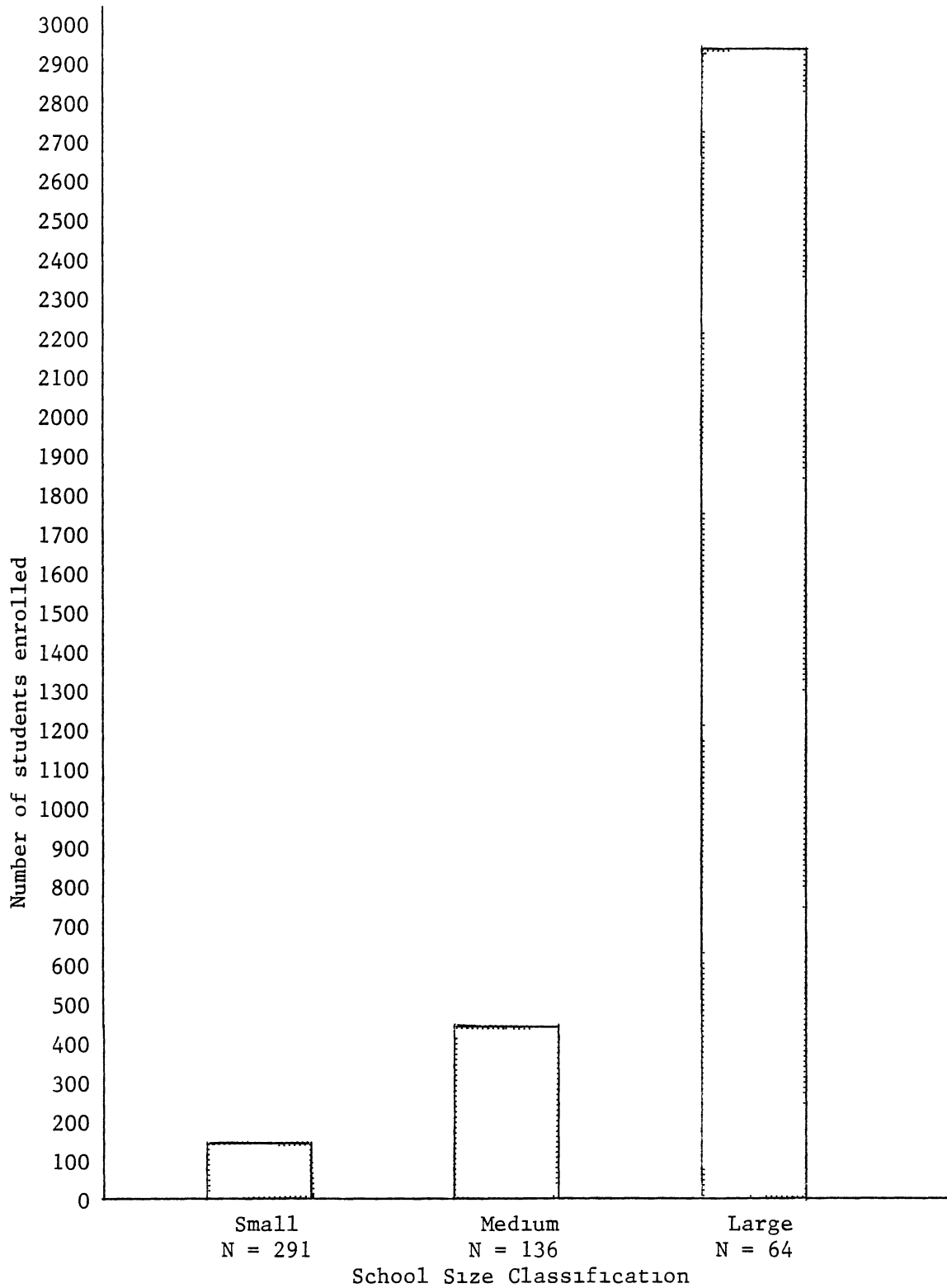


Figure 1 School Size Classification Showing Maximum Number of Students Enrolled

CHAPTER II

REVIEW OF LITERATURE

This review of the literature is to determine what has been written concerning the influence of industrial arts experiences on students as they decide to enroll or continue in trade and industrial education programs. This review revealed that there is very little literature directly related to the effect of industrial arts on trade and industrial education.

Much of the literature is of a descriptive nature, that is, dealing with the philosophical objectives of either industrial arts or trade and industrial education. The literature also addressed the value of industrial education as a means for implementing the teaching of other subjects.

This review of literature is addressed in the following six topics:

- 1 The influence of federal and state government on industrial arts,
- 2 The industrial arts/trade and industrial education relationship,
- 3 Articulation between industrial arts and trade and industrial education,
- 4 Contributions of industrial arts to other subject areas,
- 5 Industrial arts influences on students,
- 6 Industrial arts influences on student enrollment.

A national survey of the research conducted in the United States on industrial arts education from 1968 through 1979 reported

There have been relatively few studies involving vocational choice and industrial arts. For a field that has claimed to provide significant exploration and awareness level activities in career education, industrial arts has not evidenced any significant degree of interest in terms of its impact on occupational choice of students who have experienced it.

Many of the benefits attributed to industrial arts are not well documented, particularly as they relate to attitude and achievement claims. (Dyrenfurth & Householder, 1980, p. 87)

Hand and computer searches, such as ERIC, using a variety of descriptors (see Appendix A), revealed no related studies or research instruments.

Governmental Influence on Industrial Arts

The earliest federal legislation to affect industrial arts, the Morrill Act, passed by Congress in 1862, provided for the establishment of colleges to teach agriculture and mechanical arts. At that time only a very small percentage of the people went to college, but the creation of those colleges was one factor in the early beginnings of industrial arts. Because of the desire for the "industrial classes" to have an education equivalent to that of the literary and professional classes, the public schools began to incorporate skill training with general education. One of the earliest proponents in the 1870s of "manual training" was Calvin M. Woodward from Washington University, Saint Louis. He felt that general education should include "all of the manual arts, the mechanical processes, and the tools used in common in the trades and occupations" (Barlow, 1967, p. 35). "Manual training" was to aid in educating the "whole boy," not just his mind as the classical curriculum of the time did.

At the turn of the century, manual training was, in many instances, preparatory for the trade schools which, up to that time, had been privately funded (Barlow, 1967) With the increase in public vocational education came confusion about the purposes and value of manual training This confusion continued even after the name change to "industrial arts" during the early part of this century (Wright and Barella, 1981)

The most recent federal legislation regulating vocational education and its funding is the Carl D Perkins Vocational Education Act (Public Law 98-524) which was passed October 19, 1984 Section 251(a)(14) names "prevocational programs," and Section 251(a)(15) names "programs of modern industrial and agricultural arts" as programs for which a state may use federal funds, provided those programs are identified in a State Plan

A State Plan,

submitted for a three-year period in the case of the initial plan and a two-year period thereafter, together with such annual revisions as the State board determines to be necessary (Sec 118(a)(1)(A)),

contains methods of providing and evaluating vocational education in a state and otherwise meeting the criteria of the Vocational Education Acts

Article XI Section 151 5 of The Oklahoma School Law, 1971, provides for

the teaching of vocational education such as industrial arts and such other aspects of vocational education as will promote occupational competence among school children and adults as potential and actual citizens of the state and nation

According to A Guide for Industrial Arts Education in Oklahoma (1979), industrial arts in Oklahoma is unique

Modern industrial arts is unique as an educational program with defined obligations in both General and Vocational Education. By the very nature of its programs, industrial arts can provide a bridge between academic education and the segments of vocational education that deal with technical and trade and industrial education. (State Industrial Arts Curriculum Committee and State Supervisor of Industrial Arts, 1979, p. 4)

The Industrial Arts Curriculum Committee and State Industrial Arts Supervisor based the relationship of industrial arts to vocational education on Rules and Regulations dated October 3, 1977, in the Federal Register, Section 104.592.

Because of those rules and regulations

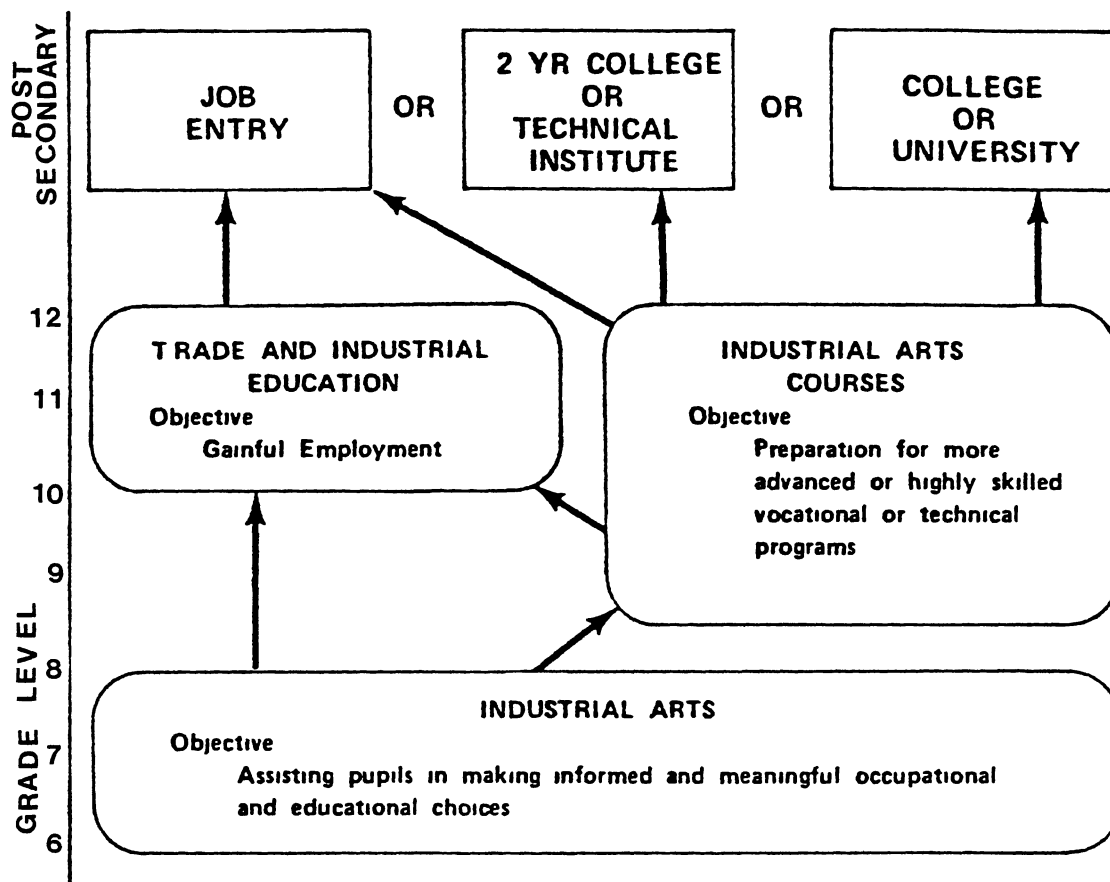
industrial arts has an obligation to provide programs that (a) assist individuals in making informed and meaningful occupational choices in industry and technology, (b) provide occupational information and exploratory experiences pertaining to a broad range of occupations including training requisites, working conditions, salaries or wages, and other relevant information, and (c) prepare individuals for enrollment in vocational and technical education programs. (State Industrial Arts Curriculum Committee and State Industrial Arts Supervisor, 1979, p. 11)

For an illustration of the relationship of industrial arts to other vocational education as it meets the objectives of the Educational Amendments of 1976 (Public Law 94-482) see Figure 2. Industrial arts may begin in elementary school, but the illustration begins with the sixth grade and continues through high school and the post-secondary years.

As a result of the obligation of industrial arts to perform its functions, educators acknowledge that the industrial arts/technology education student will have

a foundation in safety, the use of tools, equipment, and materials, and will be familiar with occupationally specific nomenclature and decision-making skills. (Stacy, 1985, p. 1)

Stacy adds that the industrial arts/technology education students



Note Objectives shown above refer only to the objectives of the Vocational Education Act

Source State Industrial Arts Curriculum Committee and State Supervisor of Industrial Arts, A Guide for Industrial Arts in Oklahoma (1979)

Figure 2 Relationship of Industrial Arts and Trade and Industrial Education as Outlined by Federal Regulations

would have had the "opportunity to explore a wide range of occupations to determine if any interest existed" (p 1) Because of that opportunity, Stacy says those students who have had industrial arts/technology education would not contribute to the number of students who dropped out of a trade and industrial program prior to completion

In personal communication with several State Supervisors of Industrial Arts, Powell, Stacy, and Steeb (1984), said

there have been no studies to determine whether industrial arts students truly perform better or have a better survival rate in trade and industrial programs than those who have not had industrial arts

Not only have there been no studies of performance or survival rate of students with and without industrial arts experience in trade and industrial programs, but Baker, Kapes, Somers, and Sharpe (1980) wrote that no method currently exists that actually measures "the contribution of industrial arts, in terms of either quality or quantity, to vocational education" (p 1)

Industrial Arts/Trade and Industrial Education Relationship

Most of the information found in the literature concerning the relationship of industrial arts and trade and industrial education concluded that industrial arts is prevocational or exploratory while trade and industrial education is occupationally specific (Dyrenfurth, 1984, Swanson, Wright, & Halfin, 1970, Williams, 1968)

London (1970) stated that, being prevocational or exploratory, industrial arts has four goals

- 1 Inform them [students] of the nature and extent of job opportunities and requirements in the various industrial industrial occupations

- 2 Develop interest in following such an occupation as a career
- 3 Teach the basic tool skills and technical knowledge that constitute the foundation of the industrial occupations
- 4 Develop desirable personality traits, attitudes, and work habits (p 295)

Twelve years later, those four goals existed within three of the four goals Worthington (1982) ascribed to industrial arts

- 1 Provide the opportunity for students to acquire as many exploratory experiences as possible The offerings in industrial arts should parallel the vocational trade and industrial and technical courses that the student will be choosing to enter in the higher grades of high school or after graduation
- 2 Provide information pertaining to other technologies, occupations, or careers
- 3 Assist students in making knowledgeable and meaningful career choices
- 4 Provide in-depth skill training for those students who do not have easy access to trade and industrial courses (p 4)

Larson (1969) wrote

The role of industrial arts must be accepted as that of primarily teaching students 'about work' rather than focusing specifically on a single trade, occupation, or even a cluster of occupations This is the job of occupational education (p 199)

Industrial arts is prevocational, and, as such, it "must help provide the opportunity for early identification of individual interests, abilities, and occupational goals in broad categories" (p 199) Larson further stated that if our educational system is going to accomplish this goal, the curriculum of industrial arts must be "integrated with a system's approach to vocational and technical education which must follow" (p 199)

Articulation Between Industrial Arts and Trade and Industrial Education

Articulation is the integration of two or more programs so that they are distinct, sequential programs Articulation is a necessity,

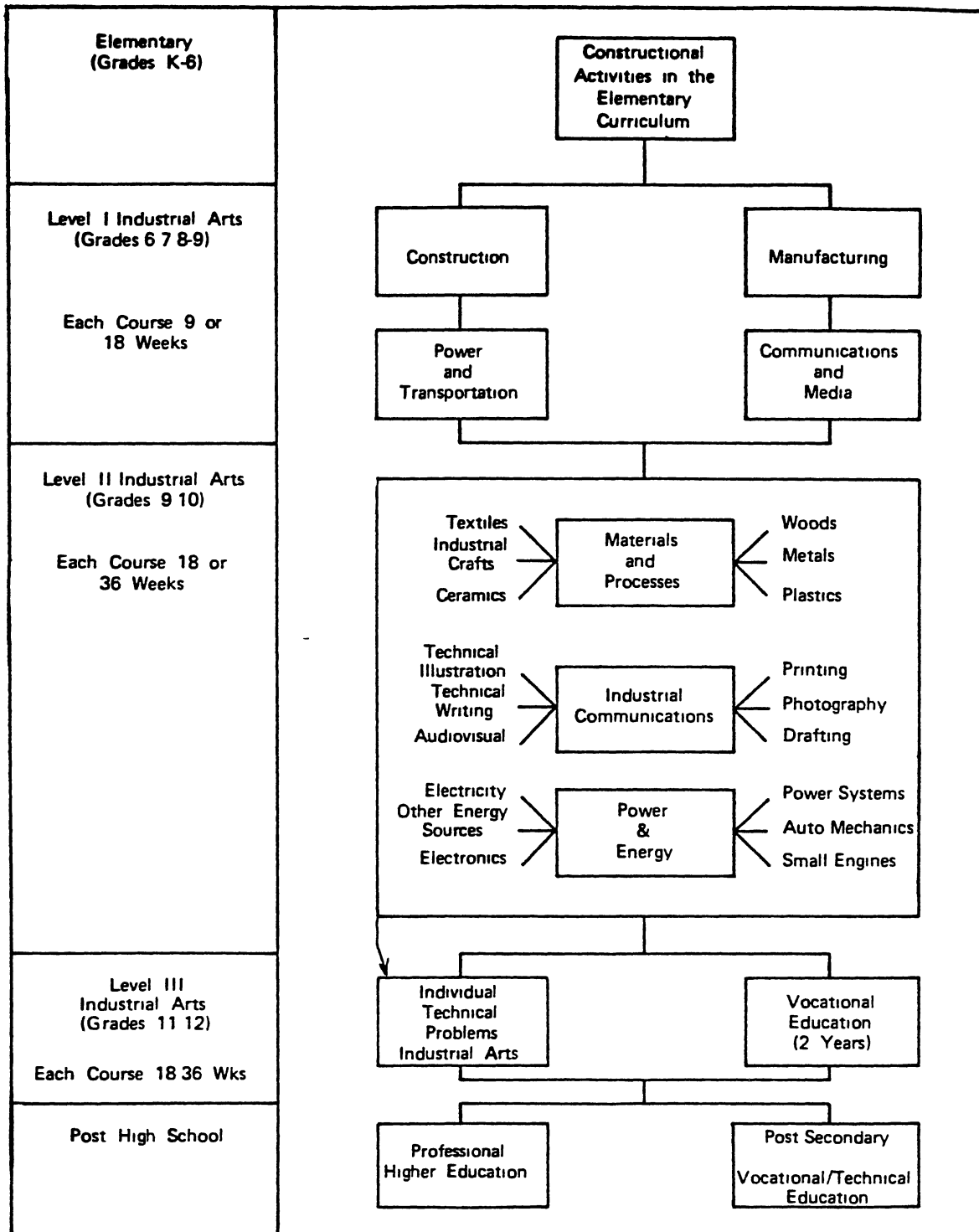
as noted in the literature

Articulation usually means establishing close working relations among elementary, secondary, and post-secondary schools. The Commission stretches the meaning--we also advocate strong, positive working relations within the secondary school itself (National Commission on Secondary Vocational Education, 1985, p. 17)

The components of successful articulation are planning, implementing, and evaluating with cooperation and coordination between the leaders of the programs to be articulated (Kraska, 1980)

Curriculum construction should reflect the combined efforts of the whole school, curriculum experts, advisory committee, and other community resources, to integrate general education and vocational education. There should be a logical sequence of courses, and each course should have a written description so that each teacher will have a guide by which to plan his instruction (Giachino & Gallington, 1977)

Figure 3 illustrates the structure of an industrial arts curriculum that can be a basis for industrial arts program development and articulation with later education



Source State Industrial Arts Curriculum Committee and State Supervisor of Industrial Arts, A Guide for Industrial Arts Education in Oklahoma (1979)

Figure 3 Industrial Arts Curriculum Structure

In an interview reported by Cuneo (1983) in Industrial Education, Layne, a vocational education administrator with the Saint Louis, Missouri, public schools, indicated a need for better articulation between industrial arts and the vocational education that follows

In the same interview, Cuneo (1983) quoted Steeb of the Florida Department of Education, pointing out that federal vocational funding necessitated articulation between industrial arts and trade and industrial education. There is a considerable amount of articulation in Florida, as evidenced by the fact that one-third of the students enrolled in industrial arts in senior high schools in Florida must go on to enroll in industrial education (trade and industrial) courses. There is a definite sequence of courses, and those industrial arts credits earned in earlier high school years count for trade and industrial credit on completion of the trade and industrial program (Steeb, 1984)

Three school systems in Michigan have completed a two-year pilot program of articulation involving vocational and prevocational teachers. The articulation process included curriculum review and development, testing, and record keeping. In the opinion of the authors, this type of articulation has much to offer teachers in high school programs (Baker & Gustafson, 1984)

Williams wrote in 1968 that the Warren, Ohio, school district had developed an articulation process throughout the public schools in Warren. This articulation included requiring industrial arts exploratory courses for seventh and eighth grade boys and giving ninth and tenth grade students the opportunity to explore the vocational programs available by rotating through the programs throughout the year.

From the beginning of the articulation program to the publication of the article, the percentage of students in the vocational programs who dropped out of school had decreased to 3.43 per cent per year (Williams, 1968)

Post-secondary and secondary articulation generally involves completely separate schools. Junior colleges and area vocational-technical schools often establish articulation programs. Kraska (1980) attributes much of this between-schools articulation to the influence of the American Association of Community and Junior Colleges and the American Vocational Association.

In Oklahoma, Tulsa Junior College and Tulsa County Area Vocational-Technical School have instituted articulation in some of their programs (Phillips & Lemley, 1983). Among them are programs that lead to careers in the fields of business and management, computers, health, engineering, and industry. Tulsa Junior College allows students who have taken courses at Tulsa County Area Vocational-Technical School to test out of certain classes through their credit by examination program (Tulsa Junior College Regents, 1986).

Industrial Arts Contributions to Other

Subject Areas

Several authors addressed the contribution industrial arts can make to other subjects in school. The majority of them wrote as a response to the publication of A Nation at Risk (Gardner, et al, 1983). A Nation at Risk was critical of high school education and vocational education in particular.

Although The Contributions of Industrial Arts to Selected Areas of Education, 31st Yearbook, 1982 (American Council on Industrial Arts Teacher Education, Maley & Starkweather, eds), is more comprehensive than other reports, it predated the report of Gardner and the National Commission on Excellence in Education. The yearbook addressed vocational education and career education, both of which include industrial arts. Other areas included were programs for the gifted and the handicapped, economic education, consumer education, reading, language development, and the whole student in school.

Industrial arts/technology education has strong connections with all subject areas, but particularly with math, science, and social studies. Maley (1984) gave three reasons:

1. The content of industrial arts/technology education is integrally tied in with essentially all of the disciplines of the secondary school.
2. There is no logical rationale that supports the compartmentalism of student inquiry by subject matter without a concern for relevance and meaning to the individual.
3. The increased emphasis on science and mathematics for all students in the schools makes it imperative that industrial arts/technology education have a significant role in student development in these areas. (p. 3)

Maley further stated that it is only natural that industrial arts/technology education experiences should be used to teach the application and interpretation of mathematics and science.

Industrial programs provide opportunities for students to apply what they have "learned" in science and mathematics. Ryerson (1984) believes that application, as a high level of learning in Bloom's Taxonomy of Educational Objectives (1956), is a higher level of learning than many students achieve in their mathematics and science classes. The application experiences enable students to remember what they

learn in industrial programs long after they have forgotten much of the other courses Ryerson further adds,

Cooperative endeavors with other teachers or departments are never easy, but they may be our route to indispensability at a time when our contribution to education is being questioned by many (p 33)

All industrial arts/technology education teachers have a responsibility to teach the basics of education (the three "Rs"), just as much as the teachers of those areas do Using and expecting correct grammar, both in writing and in speaking, and expecting students to learn to write answers to essay questions are means of emphasizing the basics (Haynie, 1985)

Fitzpatrick (1985) is another who wrote that teachers in industrial programs need to require essay tests, both to encourage students to read and write and to test the students for a deeper understanding of the material

Industrial Arts Influences on Students

Industrial arts and vocational education may be the only "significant exposure to technology" available to students in schools today (Dyrenfurth, 1983) Dyrenfurth stated that industrial arts programs, such as the industrial arts/technology education programs based on the four clusters provide students unique opportunities to

- * develop insight and understanding about the place of industry in our society,
- * appreciate the strength of free enterprise and the American economic system,
- * discover and develop individual talents, aptitudes, interests, and potentials related to industry and technology,
- * reinforce basic communication and computation skills that are important to every student's general education,

- * develop an understanding of industrial processes and the practical application of scientific principles to industry,
- * develop basic skills in the proper use of common industrial tools, materials, and processes,
- * develop problem-solving skills and creative abilities involving industrial materials, processes, and products,
- * develop an understanding of industrial and technological career opportunities and their requirements,
- * develop those traits that will help obtain and maintain employment,
- * prepare for entrance into advanced and highly skilled secondary and postsecondary vocational programs (p 3)

Dyrenfurth (1984) went on to say that in prevocational programs, including industrial arts

- * They [students] learn the structure of the knowledge and the skills associated with the vocational field
- * They develop precursor skills, attitudes, and competencies that serve as a solid foundation for vocational education
- * They [prevocational programs] provide a 2-3 year head start on all so important attitudinal building vocational student organization experience
- * They allow students to explore various occupations and learn typical career paths This tends to facilitate tentative choice and solidify an interest in the vocational course chosen
- * Because of their pervasive nature, i e most students experience one or more prevocational courses, they serve as a vitally important recruitment tool that exposes students to the variety of opportunities available through vocational education and the locations where they pursue such programs (p 6)

The National Center for Education Statistics (1984) reported that a study of the transcripts of 12,000 students who graduated from high school in 1982 showed that 89 per cent of those students had taken an exploratory vocational education course in agriculture, business, consumer home economics, industrial arts, marketing, or trade and industrial education More than one-third (35 per cent) of all the students had taken at least one industrial arts course

Influences on Student Enrollment

The review of literature revealed that a parent or parents and other family members and teachers repeatedly have been important influences

Peters (1941) found that when high school seniors were asked to mark the first and second most influential factors in their selection of a vocation, factors which were marked the most frequently were a parent, a friend, a professional acquaintance, and a relative other than a parent. The group marked second most influential included a parent, opportunity for advancement, a relative other than a parent, and opportunity for quick employment

Lungstrum (1973) asked high school students to identify in preferential order, from a list of ten choices, those three persons who had given them the most helpful information in their occupational choices. The most helpful sources of information were mother, teachers, workers in the occupation, fathers, and friends. The members of that group of students who had made occupational choices, when asked who was the most influential on their occupational choices, reported parents and teachers were more influential than friends and counselors.

Cobb and Cardozier (1966) learned that, among a group of 1812 ninth and twelfth graders, the students felt they themselves had the greatest influence on their own choice of curriculum. Mothers were the next most influential group, according to the ninth graders, but the twelfth graders ranked two different teachers above their mothers. Fathers ranked fifth, while friends were sixth, followed by counselors. Among those students who were enrolled in a vocational curriculum, three per cent of the ninth graders and seven per cent of the twelfth graders reported a shop or industrial arts teacher to be most influential. Two per cent

of the ninth graders and six per cent of the twelfth graders in a general curriculum reported a shop or industrial arts teacher most influential

Cobb and Cardozier also reported that the principal was delighted that he ranked last in reported influence because it meant that his many influences on the students' curriculum choices were indirect

Abusal (1983), however, found that no person, family member or other, had a significant influence on the student's choice of a vocational program. He also noted that industrial arts and other prevocational courses had no significant influence on student enrollment in a program. Significant factors in the Abusal study were "student's interest, high income, availability of job in the area of training, good working conditions, and ability in the area of training" (p. 82). Abusal stated the data tended to pose the question, "How could the students come to realize the value of the influencing factors as being important in their decisions?" (p. 82)

According to data compiled by the Oklahoma State Department of Vocational and Technical Education (1986) for the 1984-85 school year, 6.9 per cent of the students enrolled in trade and industrial education programs left school prior to completion of the program but after they had completed fifty per cent of the program. Those who transferred out of trade and industrial education into general academics were 5.4 per cent of students enrolled in trade and industrial education. Another 2.7 per cent of the trade and industrial education students transferred to another vocational education program.

Simmons (1979) reported that most of the approximately 25 per cent who were not returning for a second year were not returning because their career objective was not that for which they were being prepared.

Summary

The literature is, to some extent, contradictory regarding the influence of industrial arts on students. Dyrenfurth and Householder's statement in 1979, "the benefits attributed to industrial arts are not well documented" (p. 87), was followed in 1983 and 1984 by Dyrenfurth's lists of the opportunities provided students in industrial arts.

One of the studies cited mentioned an industrial arts teacher as having an influence on six to seven per cent of the twelfth grade students enrolled in the vocational and general curriculums. In that same study, the students reported that they had the greatest influence on their own curriculum choice. There was no indication what caused the students to decide they wanted to enroll in a particular curriculum. The Abusal study indicated students gave reasons for enrolling in a course but gave no indication of how they reached their conclusions.

No study has indicated that students who have had an industrial arts course enjoy an advantage when they decide in which trade and industrial program to enroll and whether to stay in the program until they complete it.

CHAPTER III

METHODOLOGY

The purpose of this study was to determine whether industrial arts experiences influence high school students as they decide to enroll or continue in a trade and industrial education program. The methodology was designed to answer the following questions:

1. Is there an association between a student's taking industrial arts courses and his or her decision to enroll in a particular trade and industrial course during the later years of the high school experience?

2. Is there a significant difference in the plans for enrolling in the second year of a two-year trade and industrial education program of those students who have had industrial arts prior to enrolling in the trade and industrial program and of those students who have not had industrial arts?

In addition to those two major questions, there are four other questions:

A. Do the results of the research vary by the type of industrial arts course (general industrial arts, woods, metals, drafting, or other) in which the student was enrolled?

B. Do the results of the research vary by the size of the home high school, whether small, medium, or large?

C. Do the results of the research vary by the sex of the students?

D Do the results of the research vary by whether the trade and industrial education program is located at the home high school or the area vocational-technical school?

Selection of the Population

Because high school students enrolled in trade and industrial education programs are best able to tell what influenced them to enroll in a particular program, the researcher determined that high school students enrolled in trade and industrial education programs in the comprehensive high schools and the area vocational-technical schools in Oklahoma would be the appropriate population to survey

The researcher, assisted by a panel of experts, selected those schools whose students were demographically representative of that population. Comprehensive high schools had to meet the selection requirement that they offer more than two trade and industrial education programs. The comprehensive high schools were all medium-sized, according to the definition of size recommended by Myers (1986) and used for the survey. This was because the small schools could not support three programs, and the large schools found the area vocational-technical schools more appropriate for their needs.

Students from the area vocational-technical schools were from small, medium, and large high schools. Schools were located in urban, suburban, and rural areas and in different geographical regions of the state (see Figure 4). The comprehensive high schools (medium size) were Guymon, Holdenville, Kingfisher, and Pawhuska. Included in the area vocational-technical schools were Eastern Oklahoma County Area Vocational-Technical School, Choctaw, Kiamichi Area Vocational-Technical School, McAlester,

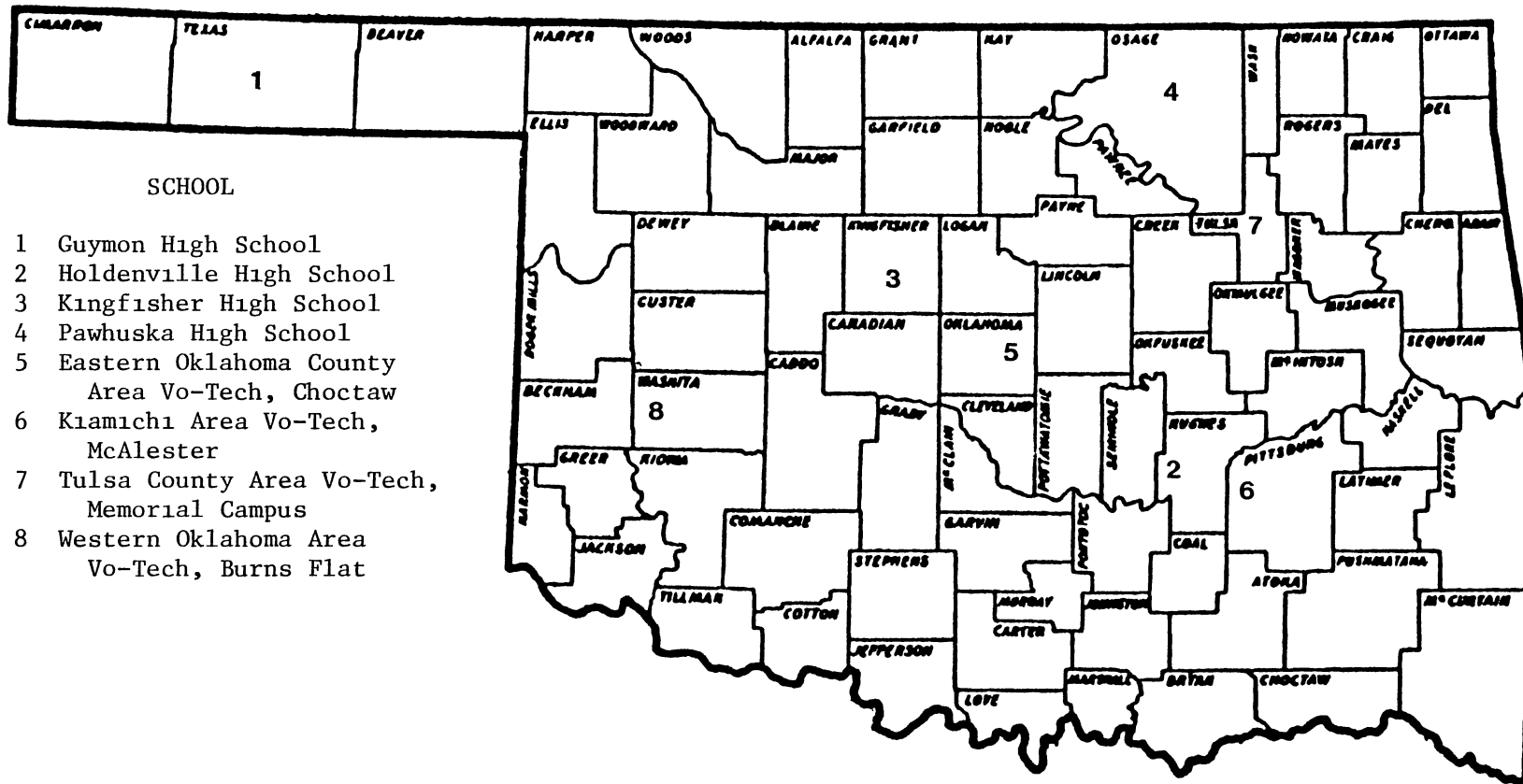


Figure 4 Location of Schools Surveyed

Tulsa County Area Vocational-Technical School, Memorial Campus, and Western Oklahoma Area Vocational-Technical School, Burns Flat

Development of the Survey Instrument

The review of literature revealed no instrument already developed which could be used to answer the questions to be dealt with in this study. Consequently, it was necessary for the researcher to develop a questionnaire (see Appendix B) to be completed by the high school students enrolled in trade and industrial education programs in comprehensive high schools and area vocational-technical schools.

After development of the questionnaire by the researcher, suggestions for modification and revision were submitted by a panel of experts. The questionnaire was then field tested by administering it to thirty students enrolled in trade and industrial education programs at Caddo-Kiowa Area Vocational-Technical School. Consideration of comments and questions of the field-test group led to further changes and refinements before final approval by the panel of experts.

On the cover page of the questionnaire, the student was asked to write the name of his or her home high school and the name of the school where the trade and industrial program was located. The first three questions of the questionnaire were written to describe the student, his or her age, grade, and sex. The next three questions described the trade and industrial program in which the student was enrolled, its location, whether in an area vocational-technical school or comprehensive high school, the name of the program, and the length of time the student had been in the program. The next two questions pertained to plans to enroll

in the program the next school year and reasons for not enrolling in the program if that were the student's intention

The ninth question asked if the student had ever taken an industrial arts course, if not, the student was asked to terminate the questionnaire

If the student had taken industrial arts courses, he or she was asked to mark in which grades the courses were taken and to identify the types of industrial arts courses. The next three questions concerned repetition and relative ease of the trade and industrial course as the result of having had the industrial arts course

The final question asked the student, "Who or what influenced your decision to enroll in the T & I [trade and industrial] course?"

Data Collection

Upon selection of the schools to survey, the researcher contacted an administrator at each school to obtain permission to administer the questionnaire and to make the necessary arrangements. The researcher then drafted a letter to confirm the appointment with each administrator (see Appendix C). All the school districts were within three weeks of summer vacation.

The researcher made on-site visits to six of the schools to administer the survey. Due to requests of the administrators involved, the researcher mailed questionnaires to two of the schools. The two administrators, from Guymon and Western Oklahoma Area Vocational-Technical School, then asked their teachers to have their students complete the questionnaires and returned the questionnaires to the researcher by mail.

In each of the six schools visited, the researcher, accompanied by an administrator, administered the survey instrument to the students.

Because two classes in one school had gone to work on off-campus projects (on-the-job training) and some of the students in the area vocational-technical schools had already completed their school year, approximately fifty students in the six schools were not surveyed

Those students who completed the survey, except for fifteen adults who completed the forms by mistake, and whose survey forms were excluded from analysis, were students enrolled in trade and industrial education programs. Five hundred students completed the survey instrument from which data could be compiled (see Table I). Of the 500 students, 177 were twelfth graders, while 277 were eleventh graders, and 46 were tenth graders. Twenty-nine sophomores, 62 juniors, and 49 seniors were enrolled in trade and industrial education programs in the comprehensive high schools. Of the area vocational-technical school students, 128 were in the twelfth grade, and 215 were in the eleventh grade.

TABLE I
GRADE AND ENROLLMENT STATUS OF STUDENTS SURVEYED

Grade	Area School Students			Comprehensive H S Students			TOTAL
	Industrial Arts Experience Yes	No	Subtotal	Industrial Arts Experience Yes	No	Subtotal	
12	99	29	128	32	17	49	177
11	166	49	215	47	15	62	277
10	10	7	17	19	10	29	46
TOTAL	275	85	360	98	42	140	500

Seniors were excluded from the analysis of the number planning or not planning to enroll for a second year, as were the 18 juniors who had already completed a second year. Sophomores and juniors were grouped together as first-year trade and industrial education students for that analysis.

Of the 373 students who had taken industrial arts courses, 176 of them were juniors and sophomores enrolled in trade and industrial education programs in the area schools, while 66 were taking trade and industrial programs in the comprehensive high schools. Of the seniors, 131 had taken industrial arts. Sixteen of the juniors who had already taken the second year of the program had had industrial arts.

Twenty of the students were undecided at the time they completed the survey whether they would enroll for a second year. Because of the small number of students in this category, in analyzing some of the questions, the number of undecided was combined with the number not enrolling in order to utilize chi-square. When cell sizes were still too small to utilize chi-square effectively after combining categories, Fisher's Exact Probability Test with Tocher's modification was utilized.

There were 40 female students, 21 were students in comprehensive high schools, while 19 were students in area vocational-technical schools (see Table II). Of the 21 female students who were juniors, there were 12 students in the area vocational-technical schools. Eight were cosmetology students in one high school.

TABLE II
GRADE AND ENROLLMENT STATUS OF FEMALES SURVEYED

Grade	Area School Students			Comprehensive H S Students			TOTAL
	Industrial Arts Experience Yes	No	Subtotal	Industrial Arts Experience Yes	No	Subtotal	
12	3	4	7	2	10	12	19
11	8	4	12	0	9	9	21
10	0	0	0	0	0	0	0
TOTAL	11	8	19	2	19	21	40

Students surveyed represented 61 high schools (see Appendix D), with 72 of the students from small high schools, 266 from medium-sized high schools, and 162 from large high schools (see Table III). The four comprehensive high schools were of medium size, according to the criteria used. Determination of school size was based on the Oklahoma Secondary School Activities Association listing of high school sizes in its September, 1985, bulletin. The large schools were among the 64 largest high schools in the state. The medium-size schools were all those high schools which were ranked sixty-fifth to two-hundredth in size. This division was based on the opinion of school superintendents and principals, as expressed by Myers (1986).

TABLE III
ENROLLMENT STATUS OF STUDENTS SURVEYED
BY SIZE OF HOME HIGH SCHOOL

High School Size	Area School Students			Comprehensive H S Students			TOTAL
	Industrial Arts Experience Yes	Industrial Arts Experience No	Subtotal	Industrial Arts Experience Yes	Industrial Arts Experience No	Subtotal	
Small	46	26	72	0	0	0	72
Medium	86	40	126	98	42	140	266
Large	143	19	162	0	0	0	162
TOTAL	275	85	360	98	42	140	500

Analysis of the Data

The data from the survey were entered into a computer to analyze, first, for frequency of "prior industrial arts experience" and for frequency of "non-continuance in the program" for various reasons

Those frequencies were then compared for differences in type of industrial arts experience, size of home high school, sex, and location of the trade and industrial program, at the comprehensive high school or at the area vocational-technical school

After examining and analyzing the data with descriptive statistics, frequency counts, and percentages, the chi-square test was used on the data for plans for enrolling. The chi-square test, a means of determining whether an observed behavior occurred more than would happen by chance, is appropriate when data is of only nominal or categorical classification,

and when it is desirable to evaluate the significance of the differences in the frequencies in the various groups (Siegel, p 105)

Chi-square was used to determine whether the difference in the numbers of the groups with and without industrial arts experience planning to enroll was significant

On the data with cells too small to utilize chi-square, even after combining the categories of "not planning to enroll" and "undecided", Fisher's Exact Probability Test with Tocher's modification was used

In the literature of statistics, there has been considerable discussion of the applicability of the Fisher test to various sorts of data, inasmuch as there seems to be something arbitrary or improper about considering the marginal totals fixed, for the marginal totals might easily vary if we actually drew repeated samples of the same size by the same method from the same population. Fisher recommended the test for all types of dichotomous data, but this recommendation has been questioned by others. A slight modification of the Fisher test provides the most powerful one-tailed test for data in a 2 x 2 table (Siegel, 1956, pp 101-102)

To measure the extent of the association between the "prior industrial arts experience" and the "plans for enrollment for the second year of a two-year trade and industrial education program", the contingency coefficient C was used. The contingency coefficient C uses chi-square as an element of its formula.

Because of the nature of the data, that is, students marked more than one industrial arts course and more than one influence if they were applicable, chi-square was not appropriate to measure the reported influences on students' enrollment in a trade and industrial education program.

The α level for rejecting or failing to reject the null hypothesis was set at .05 and $df = (k - 1)(r - 1)$ where k = the number of columns and r = the number of rows in the contingency table (see Table V)

CHAPTER IV

RESULTS OF THE STUDY

The results of this study to determine the relationship between student enrollment in trade and industrial education programs and industrial arts experience are analyzed and described in this chapter

The major objectives were

1 To determine if there is an association between a student's taking industrial arts and his or her decision to enroll in a particular trade and industrial program during the later years of the high school experience

2 To determine if there is a significant difference in the plans for enrolling in the second year of a two-year trade and industrial education program of those students who have had industrial arts prior to enrolling in the trade and industrial program and of those students who have not had industrial arts

There were also four questions related to the major objectives

A Do the results of the research vary by the type of industrial arts course (general industrial arts, woods, metals, drafting, or other) in which the student was enrolled?

B Do the results of the research vary by the size of the home high school, whether small, medium, or large?

C Do the results of the research vary by the sex of the students?

D Do the results of the research vary by whether the trade and industrial program is offered at the comprehensive high school or at the area vocational-technical school?

Analysis of the Data with Respect to Objectives

Objective 1 was to determine if there was an association between a student's taking an industrial arts course and his or her decision to enroll in a particular trade and industrial education program during the later years of high school. In the attempt to make that determination, it was found that 11.3 per cent of the 373 students who had taken at least one industrial arts course indicated that an industrial arts teacher had influenced them in their decision to enroll in a trade and industrial education program. An industrial arts course had influenced 48 or 12.9 per cent

Careers courses had influenced 35.9 per cent or 134 students. Career vans had been an influence on only 20 students, 5.4 per cent of those who had taken at least one industrial arts course. Parents influenced 104 students, 27.9 per cent of those who had taken industrial arts. Counselors influenced 11.5 per cent, 43 students, while other teachers influenced 3.3 or 8.9 per cent. Friends influenced 14.2 or 38.1 per cent to enroll in a particular trade and industrial education program.

Of the 81 who marked "other" as an influence, 63, or 16.7 per cent of all who had taken an industrial arts course, indicated they had made the decision on their own. They wrote "self", "I wanted to," "I wanted to learn it," or a similar comment in the blank provided. Those who marked "other" Nine students did not indicate who or what was the "other" influence.

Three students indicated that they had decided to go to the area vocational-technical school as the result of a tour they had taken of the school. One student enrolled in a trade and industrial program at an area vocational-technical school "to get out of high school"

Students marked as many responses as applied to them, causing the number of responses to exceed the number of students. See Table IV for numerical responses. See Figure 5 for a graph of the percentages of responses for each influence.

TABLE IV

RESPONSES OF STUDENTS WHO REPORTED INFLUENCES ON TRADE AND INDUSTRIAL ENROLLMENT

INDUSTRIAL ARTS COURSE	INFLUENCE									
	Careers Course	Career Van	Industrial Arts Teacher	Industrial Arts Course	Other Teacher	Counselor	Parent	Friend	Other	
General N = 95	36	23	21	27	10	13	28	42	21	
Woods N = 307	88	19	31	37	25	35	88	118	66	
Metals N = 110	29	11	7	21	7	18	39	38	30	
Drafting N = 146	51	8	23	27	20	20	45	61	35	
Other N = 86	34	7	15	18	4	7	17	27	18	
Any N = 373	134	20	42	48	33	43	104	142	81	

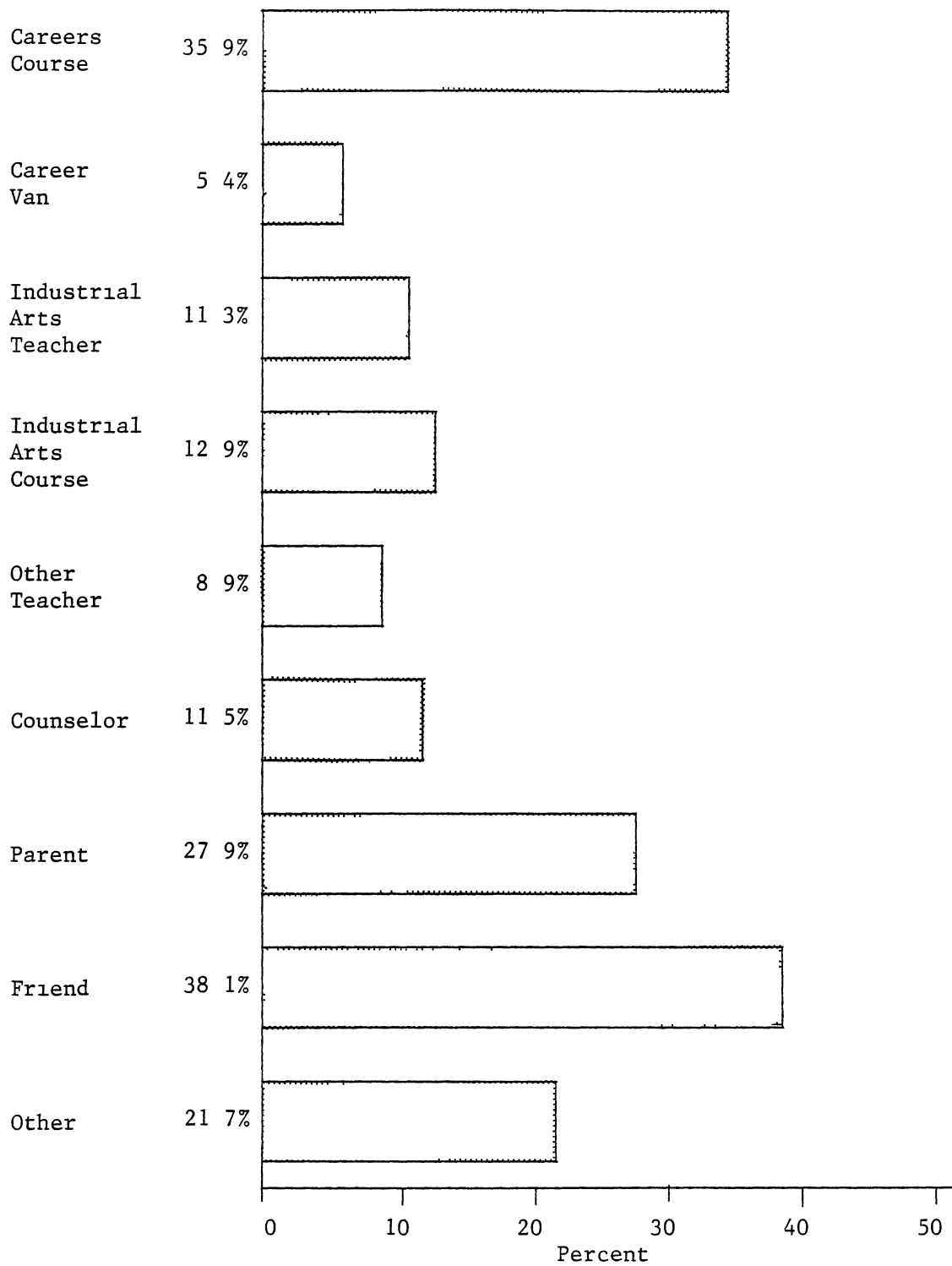


Figure 5 Percentages of Students With Any Industrial Arts Experience Who Reported Influences on Trade and Industrial Enrollment

Objective 2 was to determine if there is a significant difference in plans for enrolling for the second year of a two-year trade and industrial education program of those students who have had industrial arts prior to enrolling in the trade and industrial program and of those students who have not had industrial arts. It was found that 305 of the 500 students who completed the survey were sophomores and juniors who were first-year students (see Table V). Of those 305 students, 240 planned to enroll for the second year of their two-year trade and industrial program. Of those, 183 were 81.0 per cent of the 226 who had taken an industrial arts course. The 57 who had not taken an industrial arts course and planned to enroll were 72.2 per cent of those who had not taken an industrial arts course.

TABLE V
RE-ENROLLMENT PLANS OF FIRST-YEAR TRADE
AND INDUSTRIAL STUDENTS BY STATUS OF
INDUSTRIAL ARTS EXPERIENCE

Industrial Arts Experience	Plan to Enroll for Second Year			TOTAL
	Yes	No	Undecided	
Yes	183 (81.0%)	29 (12.8%)	14 (6.2%)	226
No	57 (72.2%)	16 (20.2%)	6 (7.6%)	79
TOTAL	240 (78.7%)	45 (14.7%)	20 (6.6%)	305
$\chi^2 = 2.939107$		df = 2		
C = .097695				

Of the students who had not decided to enroll for a second year, 25 indicated that they needed to take courses at the home high school to meet graduation requirements. Nine students reported that they did not like working in the particular program they were in, while sixteen indicated that they wanted to take a different program.

Chi-square for these categories, "previous industrial arts experience" or not and "plans to enroll for a second year" or not, is 2.939107. With $df = 2$, chi-square must be 5.99 when $\alpha = .05$ to be significant (Siegel, p. 249). The contingency coefficient $C = .097695$. As C tends toward zero there is less association between the two variables. Thus, the association between the two variables is not significant beyond that which could happen by chance.

Analysis of Data with Respect to Questions A through D

Analysis of the data with respect to Question A indicates that the results do not vary significantly. In Table IV (p. 39) are the numbers of responses for students with experience in five of the various types of industrial arts and influences on enrollment. The percentages by course, to answer Question A with regard to the first objective, are shown in Figures 6 through 10.

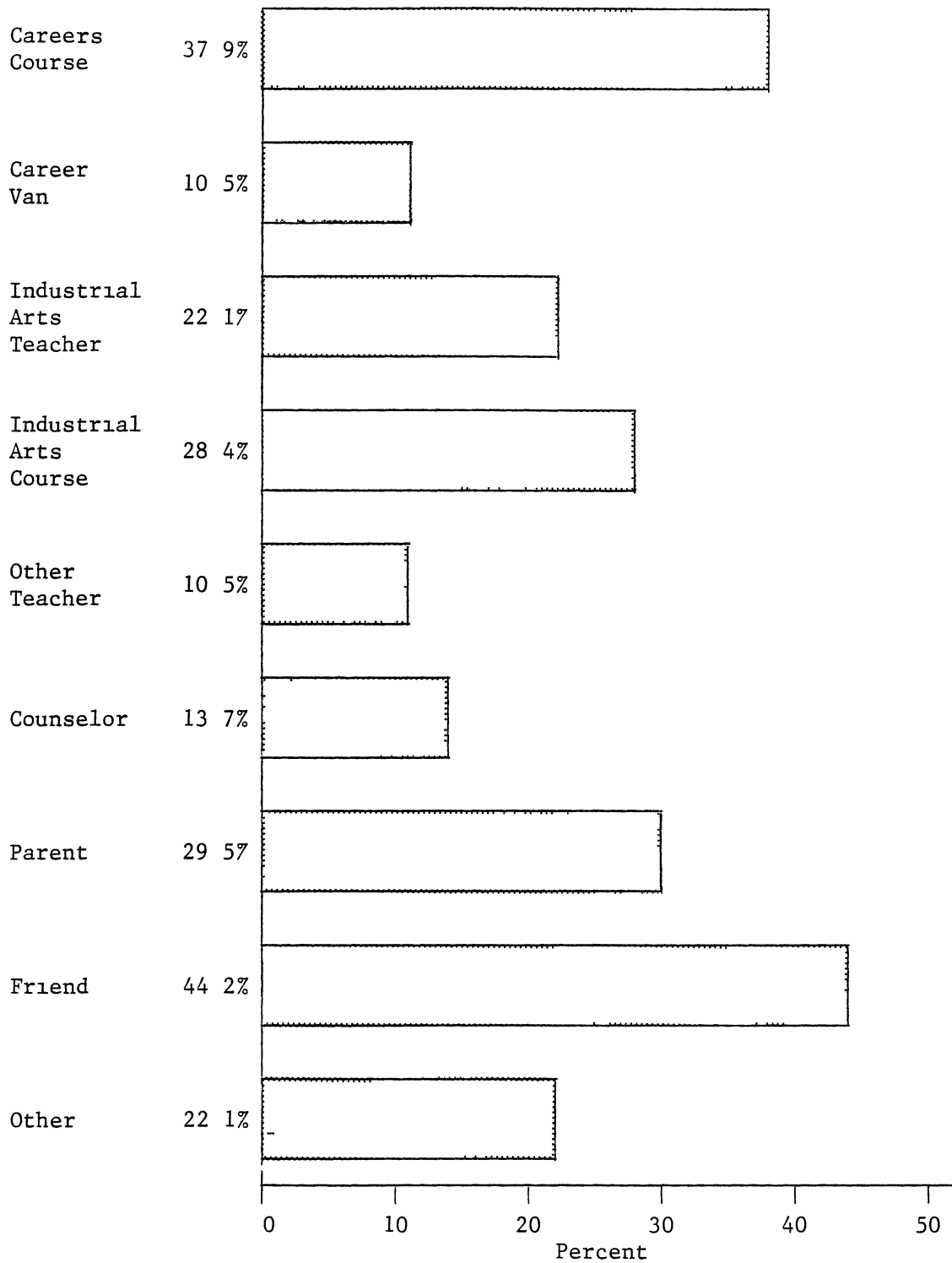


Figure 6 Percentages of Students With Industrial Arts Experience in General Industrial Arts Who Reported Influences on Trade and Industrial Enrollment

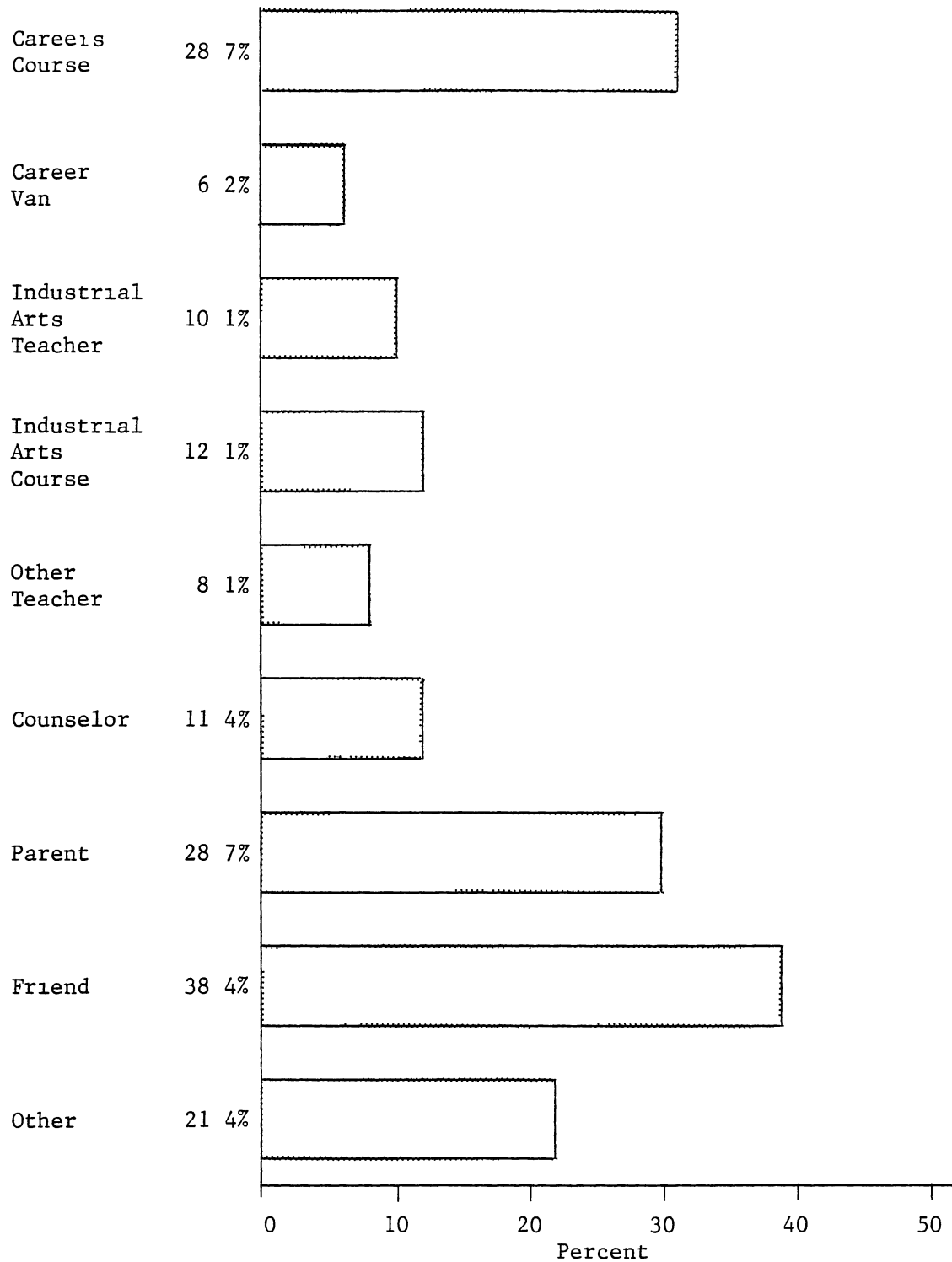


Figure 7 Percentages of Students With Industrial Arts Experience in Woods Who Reported Influences on Trade and Industrial Enrollment

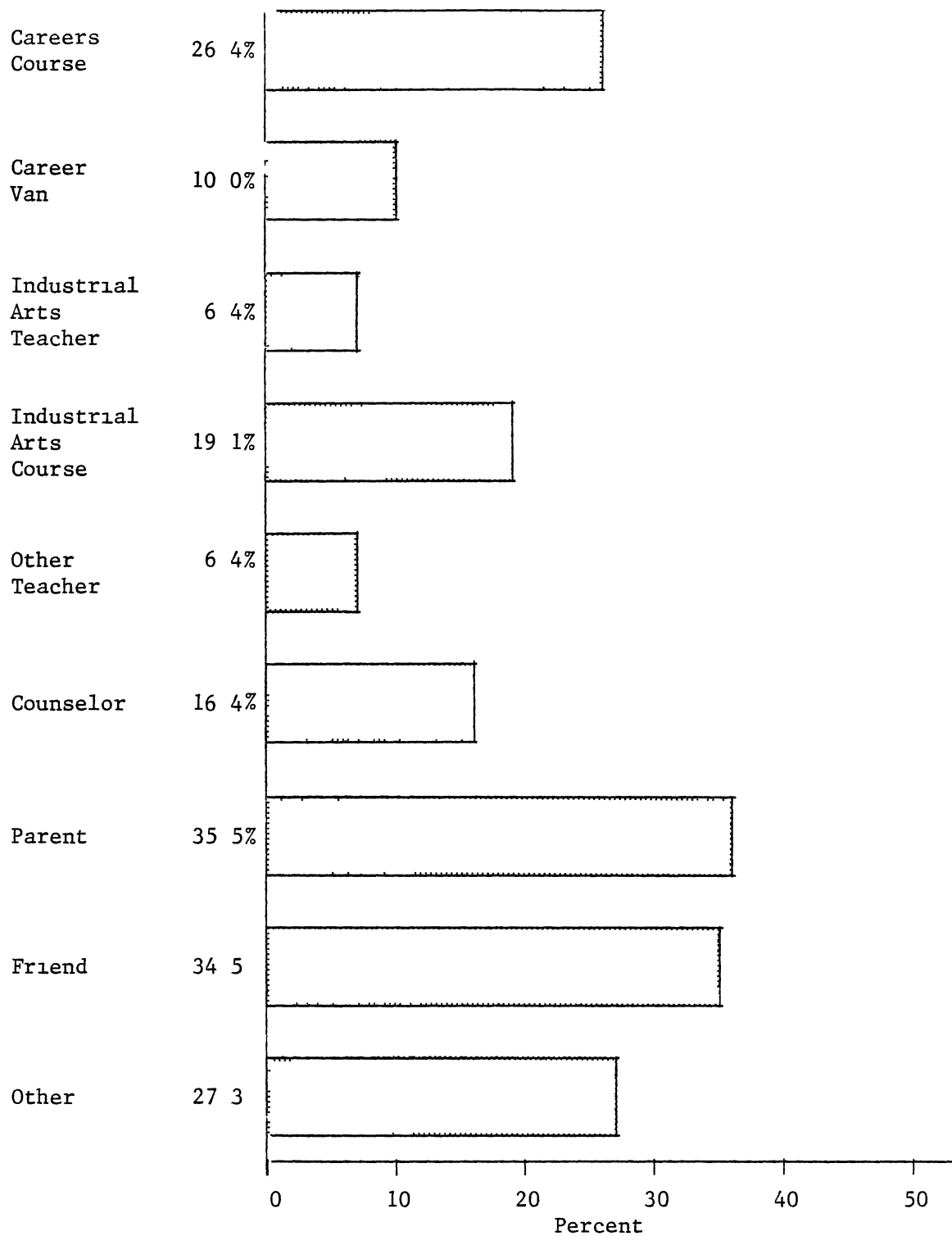


Figure 8 Percentages of Students With Industrial Arts Experience in Metals Who Reported Influences on Trade and Industrial Enrollment

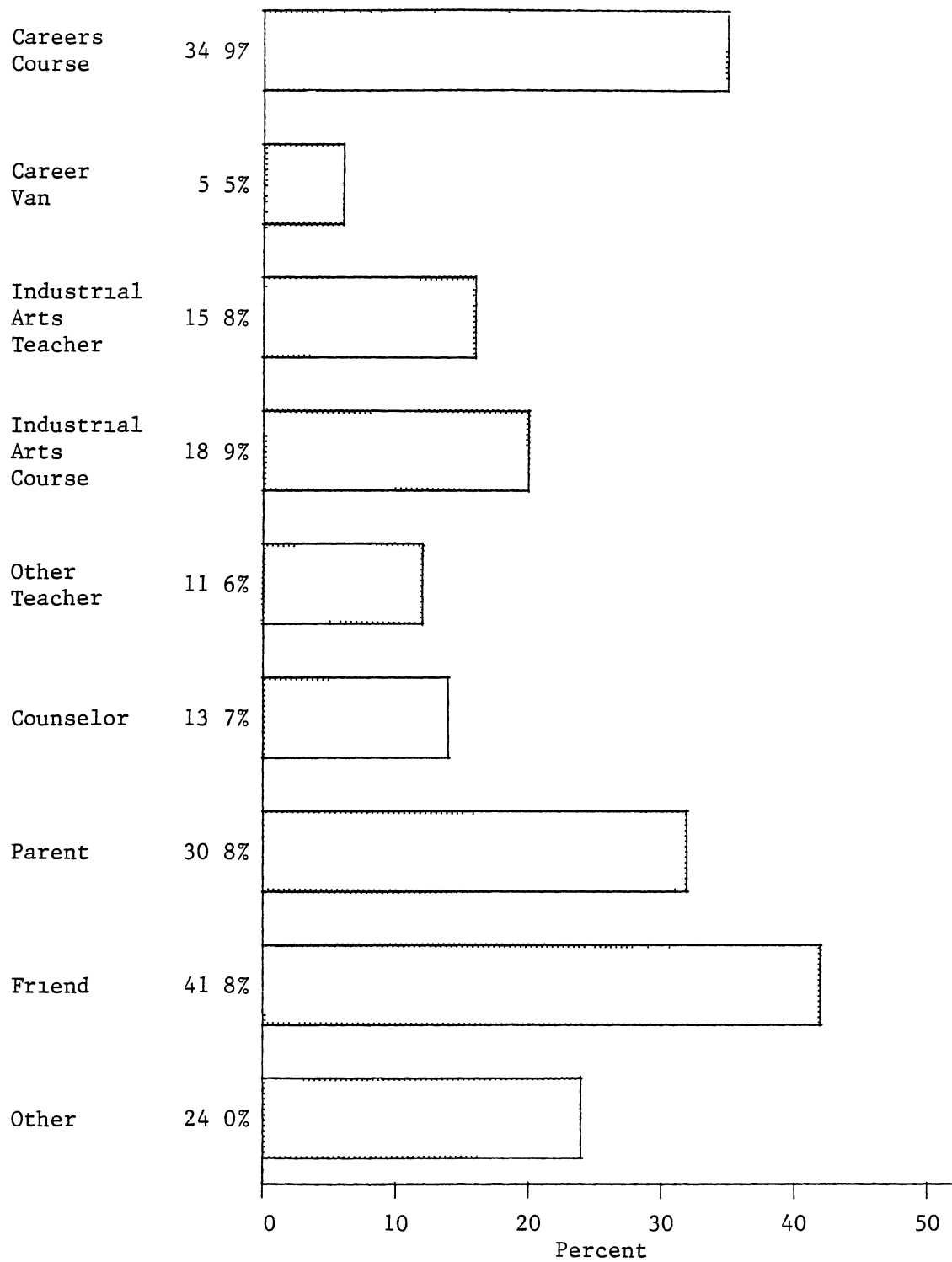


Figure 9 Percentages of Students With Industrial Arts Experience in Drafting Who Reported Influences on Trade and Industrial Enrollment

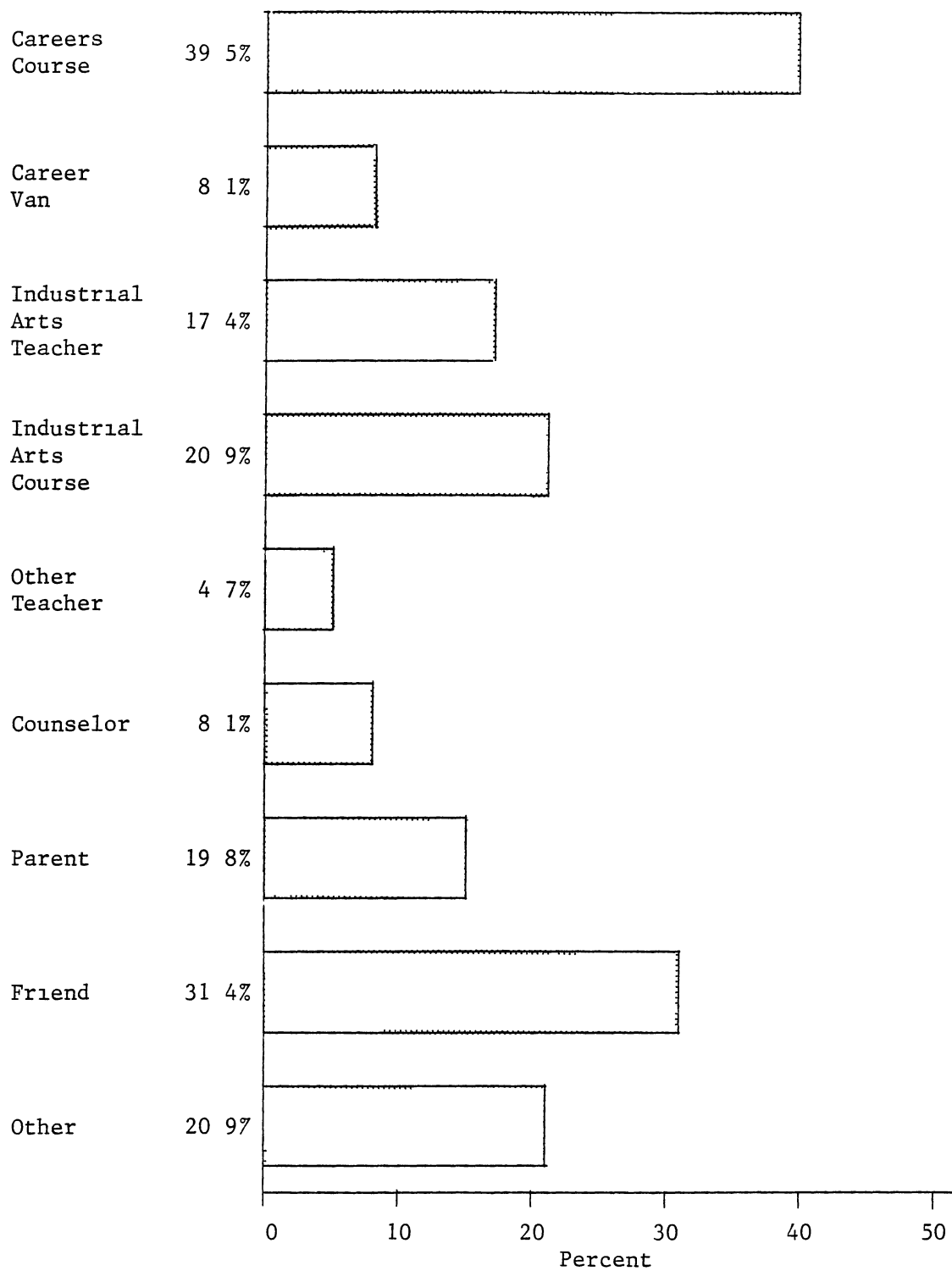


Figure 10 Percentages of Students With Other Industrial Arts Experience Who Reported Influences on Trade and Industrial Enrollment

Parents had an influence on 27.9 per cent of the students who had taken any type of industrial arts course, and on 35.5 per cent of those who had had a metals course. Parental influence rated only 2.1 percentage points apart (28.7-30.8 per cent) for students who had had woods, drafting, and general industrial arts, but the influence of parents on students who had taken other types of industrial arts rated 9 to 16 point lower than on those students who had taken the four named courses.

"Friends" ranked higher as an influence, however, than did "parents", and percentages varied less for "friends" as an influence (31.4-44.2 per cent) than for parents (19.8-35.5 per cent). The percentages of those who marked "counselor" varied from 8.1 per cent for "other industrial arts experience" to 16.4 per cent for those who had taken a metals course. The percentage who marked "other teacher" varied from 4.7 per cent for those who had taken other industrial arts courses to 11.6 per cent for those who had taken drafting.

The percentages who marked "industrial arts teacher" varied from 6.4 per cent for students who had had metal courses to 22.1 per cent for those who had taken general industrial arts. The percentage who marked "industrial arts course" ranged from 12.1 per cent who had taken woods courses to 28.4 for those who had taken general industrial arts.

"Careers course" ranked high, among "parents" and "friends" as influences, with percentages from 26.4 per cent to 39.5 per cent. "Career van" ranked lowest, with only 5.5 per cent to 10.5 per cent marking "career van" as an influence. The percentages of those who marked "other" influence ranged from 20.9 per cent to 27.3 per cent.

To answer question B, as related to objective 1, the size of the home high school affected the influence of most other factors only

slightly (see Figure 11) Parental influence on students from all three sizes of schools varied by only two percentage points An industrial arts course was an influence on 17.4 per cent of the students in small schools, but only 14.0 per cent of the students in large schools and 10.9 per cent of the students in medium-sized schools marked "industrial arts course"

Industrial arts teachers were an influence on 19.6 per cent of the students in small schools and on 13.0 per cent of the students in medium-sized schools Among large school students, however, only 6.3 per cent, one third the percentage of small school students, marked "industrial arts course" as an influence The influence of "careers course" and the influence of "friend" showed a similar, though not as extreme, difference All of the students in small schools marked "careers course" as an influence, but fewer than one-half (45.5 per cent) of the students in large schools and 62.5 per cent of the students in medium-sized schools indicated that a careers course influenced them

A career van influenced 15.2 per cent of the students in the small schools, but only 4.9 per cent of the students in medium-sized schools and 2.8 per cent of the students in large schools

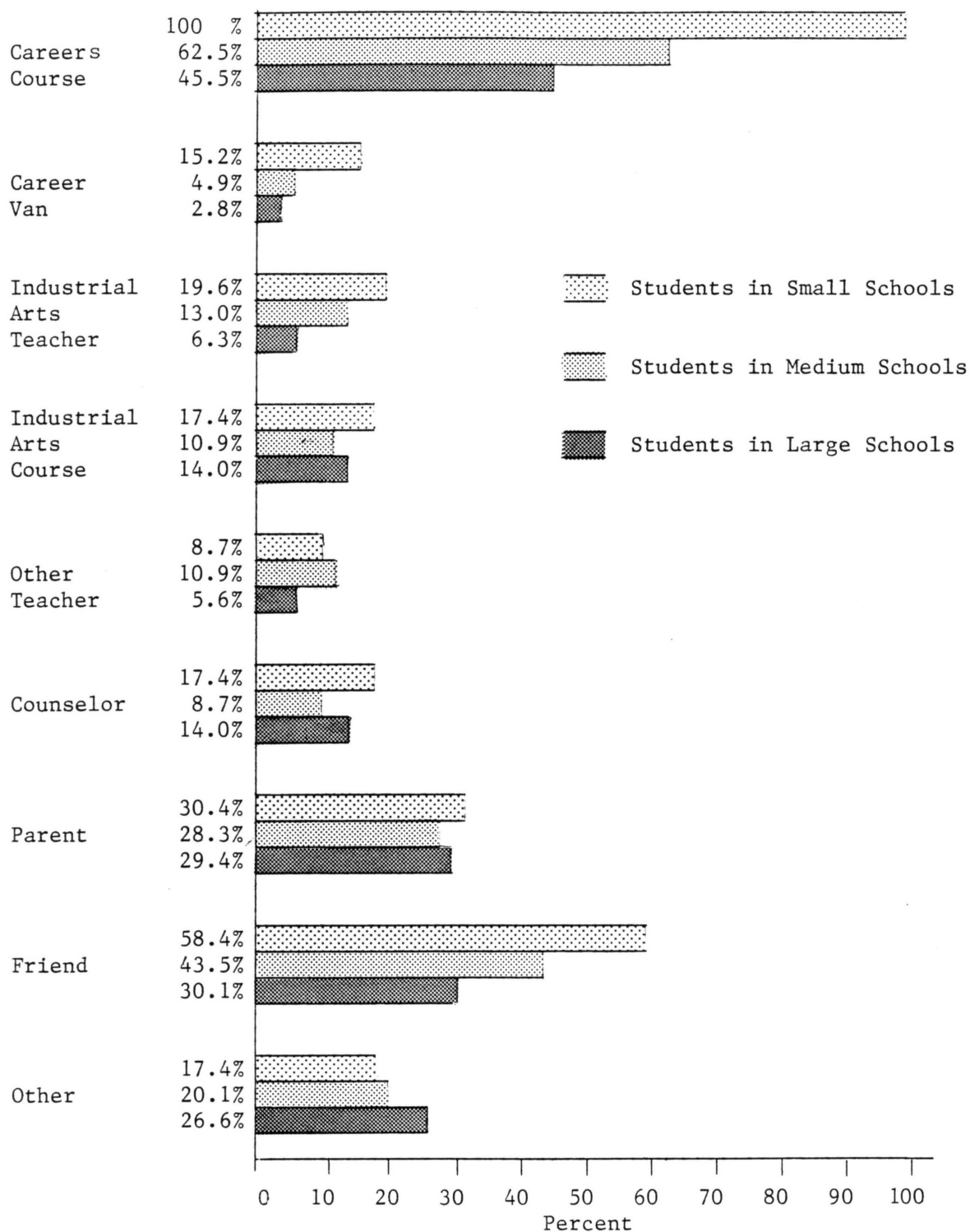


Figure 11. Percentages of Students Who Reported Influences on Trade and Industrial Enrollment by Size of Home High School

To answer Question C as related to the first objective, it was noted that of the thirteen female students, an equal number (four) marked as an influence "careers course", "parent", and "friend". Three females marked "industrial arts course" and "other". Only the percentage for "industrial arts course" and "other" was higher for females than for the sample as a whole. The percentage who marked "other" was only slightly higher, while that of "industrial arts course" was considerably higher (23.1 per cent compared to 12.9 per cent).

To answer Question D as it related to the first objective, the location of the trade and industrial program reflected the influences by the size of the high school. "Careers course" as an influence, particularly, showed this (see Figure 12). The percentage of comprehensive (medium-sized) high school students who marked "careers course" as an influence was 29.6 per cent, however, 71.6 per cent of the area vocational-technical schools (small, medium, and large high schools) students marked "careers course". Of the comprehensive high school students, only 2.0 per cent marked "career van", while 6.5 per cent of the area vocational-technical school students did so.

More comprehensive high school students marked "industrial arts teacher" as an influence than did area vocational-technical school students (13.3 per cent compared to 10.5 per cent). However, more area vocational-technical school students (14.5 per cent) marked "industrial arts course" than did comprehensive high school students (8.2 per cent).

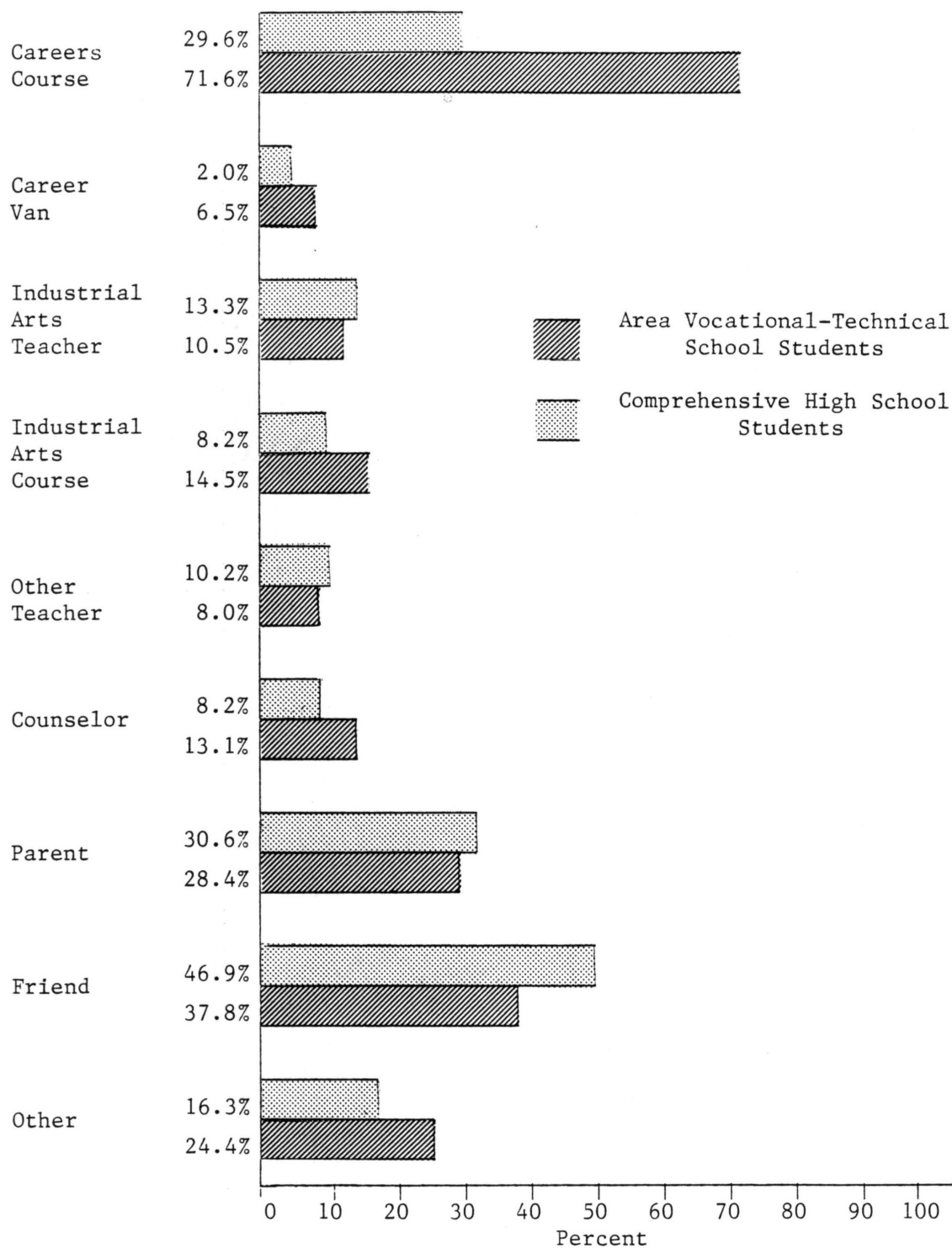


Figure 12. Percentages of Students Who Reported Influences on Trade and Industrial Enrollment by Location of Trade and Industrial Program

The numbers and percentages in Table VI are from the analysis of the data to answer Question A as it relates to the second objective. Question A concerned the association of plans to enroll for the second year of a two-year trade and industrial education program and industrial arts experience by type of industrial arts course. In order to have a significant difference in the number planning to enroll, chi-square had to be 5.99. Chi-square was below that level for all courses, therefore, the differences are not beyond that which could be expected by chance. The percentages of those planning to enroll, not planning to enroll, and undecided are near the corresponding percentages for those who have taken any type of industrial arts course. Approximately 75-80 per cent of the students plan to enroll for a second year of their two-year program, 15 per cent do not plan to enroll for a second year, and 5-10 per cent are undecided.

TABLE VI
RE-ENROLLMENT PLANS OF TRADE AND INDUSTRIAL
STUDENTS BY TYPE OF INDUSTRIAL ARTS
EXPERIENCE

Type Industrial Arts Experience	Plan to Enroll for Second Year			Chi-Square
	Yes		Undecided	
General N = 74	51 (68.9%)	15 (20.3%)	8 (10.8%)	0.0458
Woods N = 188	151 (80.3%)	27 (14.4%)	10 (5.3%)	1.90989
Metals N = 64	52 (81.3%)	10 (15.6%)	2 (3.1%)	1.90182
Drafting N = 98	78 (78.4%)	14 (14.3%)	6 (6.1%)	3.2726
Other N = 55	41 (74.5%)	8 (14.5%)	6 (10.9%)	3.14527

To answer Question B as it affects Objective 2, Table VII gives the numbers and percentages that result when the size of the home high school is considered with plans to enroll and plans not to enroll and industrial arts experience. Chi-square is given in the table for each size of school. None is significant at the .05 level with $df = 2$. Also given is chi-square for the entire table. The number of undecided was combined with the number not planning to enroll in order to compute chi square. At the .05 level and $df = 5$, chi-square, at 15.01354, exceeds the 11.07 required for significance of difference in the categories. Thus, the difference between plans to enroll for the second year of a two-year at different size schools is significant. Larger schools have a better

percentage of students who plan to enroll for the second year of a two-year trade and industrial education program than the small schools

Chi-square, when only size of school and plans to enroll for a second year are considered, is 11.943 with $df = 4$, which is also significant

TABLE VII
RE-ENROLLMENT PLANS OF TRADE AND INDUSTRIAL
STUDENTS BY SIZE OF HOME HIGH SCHOOL

Size of Home High School	Plan to Enroll For Second Year			Chi-Square
	Yes	No	Undecided	
Small				1.25173
Industrial Arts				
N = 30	20 (66.7%)	5 (16.7%)	5 (16.7%)	
No Industrial Arts				
N = 20	17 (85.0%)	2 (10.0%)	1 (5.0%)	
Medium				2.18669
Industrial Arts				
N = 117	91 (77.8%)	18 (15.4%)	8 (6.8%)	
No Industrial Arts				
N = 49	32 (65.3%)	12 (24.5%)	5 (10.2%)	
Large				0
Industrial Arts				
N = 80	72 (90.0%)	7 (8.8%)	1 (1.2%)	
No Industrial Arts				
N = 9	8 (88.9%)	1 (11.1%)	0 (0.0%)	
	$\chi^2 = 15.01354$	$df = 5$		
	C = 2165994			

Consideration of the sex of the students with and without industrial arts experience and plans to enroll or not to enroll for the second year yields the data given in Table VIII and provides the answer for Question C as it affects Objective 2. Of the male students who have taken an industrial arts course, 177, or 80.8 per cent, plan to enroll for a second year of their two-year trade and industrial education program. Of the females, six or 85.8 per cent, of those who have taken an industrial arts course plan to enroll for the second year. The percentage of students planning to enroll, but who have not taken an industrial arts course, is less than one point different for the sexes. Because of the small cell sizes, even when the categories "no" and "undecided" are combined, the Fisher Exact Probability Test with Tocher's modification was used to test the significance of the data for females. The probability of occurrence of these values is .3443433. Since this probability is more than .05, the α level set previously, there is no significance of difference. Chi-square for the data for the males is 1.69953 which also does not show significance. Because of the small categories in the data for females, the chi-square test was not appropriate to test the significance of the differences in the entire table.

TABLE VIII
RE-ENROLLMENT PLANS OF TRADE AND INDUSTRIAL
STUDENTS BY SEX

Sex	Plan to Enroll for Second Year			
	Yes	No	Undecided	
Male				Chi-Square 1.69953
Industrial Arts				
N = 219	177 (80.8%)	29 (13.2%)	13 (5.9%)	
No Industrial Arts				
N = 65	47 (72.3%)	12 (18.5%)	6 (9.2%)	Fisher Exact Probability 34434
Female				
Industrial Arts				
N = 7	6 (85.7%)	0 (0.0%)	1 (14.3%)	
No Industrial Arts				
N = 14	10 (71.4%)	4 (28.6%)	0 (0.0%)	

The results from analysis of the data to answer Question D as it affects Objective 2 are shown in Table IX. Question D pertained to the effect of location of the trade and industrial education program on the differences in plans to enroll for a second year or not of those students who had and had not had industrial arts courses. Just over eighty per cent of the students who have had industrial arts are planning to enroll for a second year of a two-year trade and industrial education program at both the comprehensive high school and the area vocational-technical school. Of those who have not had an industrial arts course, 72 per cent of the students in programs in both settings are planning to enroll. Chi-square for each location and for the entire table are given. The "undecided" and the "not planning to enroll" categories were

combined in order to have large enough cells to utilize chi-square Chi-square is not large enough for significance of any of the differences in the table at the .05 level

TABLE IX
RE-ENROLLMENT PLANS OF TRADE AND INDUSTRIAL
STUDENTS BY LOCATION OF TRADE AND
INDUSTRIAL PROGRAM

Location of Program	Plan to Enroll for Second Year			Chi-Square
	Yes	No	Undecided	
Area School				1.85174
Industrial Arts N = 172	139 (80.8%)	25 (14.5%)	8 (4.7%)	
No Industrial Arts N = 54	39 (72.2%)	11 (20.4%)	4 (7.4%)	
Comprehensive High School				4.3485
Industrial Arts N = 54	44 (81.5%)	4 (7.4%)	6 (11.1%)	
No Industrial Arts N = 25	18 (72.0%)	5 (20.0%)	2 (8.0%)	
	$\chi^2 = 2.727868$		df = 3	
	C = .0941571			

Summary

Analysis of data from the 500 survey instruments indicates that, for the purposes of this study, there is no significant difference in plans for enrollment for a second year in a trade and industrial education program for those students with and without industrial arts experience. Only when size of the home high school is considered is there any significance. That significance relates to the size of the home high school whether industrial arts experience is considered or not.

In this study, the percentage of students who plan to enroll for the second year of a two-year trade and industrial education program varied from approximately 70 per cent for those who have not had any industrial arts course to approximately 80 per cent for those who have had at least one industrial arts course.

Parents have a considerable influence on students' decisions to enroll in a trade and industrial education program, but friends have more influence in some instances. Careers courses have more influence on a student's enrollment in a small school than in a larger one. An industrial arts course has influenced more students if they have taken a general industrial arts course rather than some other type course. About ten to fifteen per cent of the students credit an industrial arts teacher or industrial arts course with influencing them to enroll in a particular trade and industrial program.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine whether industrial arts experiences influence high school students as they decide to enroll or continue in a trade and industrial education program

There were two major objectives

1 To determine if there is an association between a student's taking industrial arts and his or her decision to enroll in a particular trade and industrial education program during the later years of the high school experience

2 To determine if there is a significant difference in the plans for enrolling for the second year of a two-year trade and industrial education program of those students who have had industrial arts prior to enrolling in the trade and industrial program and of those students who have not taken an industrial arts course

There were also four questions related to the major objectives

A Do the results of the research vary by the type of industrial arts course (general industrial arts, woods, metals, drafting, or other) in which the student was enrolled?

B Do the results of the research vary by the size of the home high school, whether small, medium, or large?

C Do the results of the research vary by the sex of the student?

D Do the results of the research vary by whether the trade and industrial education program is offered at the home high school or at the area vocational-technical school?

In this study to determine whether there is an association between industrial arts experience and enrollment in trade and industrial education programs, 500 students enrolled in trade and industrial education programs were surveyed. Of those 500 students, 360 of them were enrolled in four area vocational-technical schools, and 140 were enrolled in trade and industrial education programs in their home high schools. Slightly more than one-fourth, 127 students, had not had any industrial arts experience.

Summary

Analysis of data from the 500 survey instruments indicates that, for the purposes of this study there was little that could be considered statistically significant, in either influences on trade and industrial enrollment or plans for enrollment for a second year of a trade and industrial program. While the results are not statistically significant except for the effect school size has on enrollment plans, there are points which bear mentioning.

Approximately 10-15 per cent of the students in any category indicated an influence of an industrial arts course or industrial arts teacher as they decided to enroll in a trade and industrial education program. Parents, as the literature indicated, have a strong influence. However, the influence of friends and a careers course exceeded the influence of parents for many of the categories of students.

Type of industrial arts course shows little variation in the percentages of factors marked as having been an influence except for those who took a general industrial arts course. Those students who had had a general industrial arts course marked every influence more frequently than did those students who had had "any industrial arts course". Approximately twice as great a percentage marked "career van", "industrial arts course", and "industrial arts teacher" as influences.

The size of the home high school affected the percentage of several factors noticeably. For instance, all students in small high schools marked "careers" course". Among students in small high schools, three times the percentage marked "career van" as did medium-sized-school students. Students in small high schools marked "career van" over five times as frequently as the students in large high schools did. Almost twice the percentage of small-school students marked "friend" as did large-school students. Also, the percentage of small-school students who marked "industrial arts teacher" was almost three times that of large-school students and one and one-half times that of medium-sized-school students.

The female students marked "industrial arts course" almost twice as frequently as the entire sample. The other percentages of the influences which female students marked are near the corresponding percentages of the sample.

The location of the trade and industrial program, in the comprehensive high school or the area vocational-technical school, tended to reflect the sizes of the home high schools of the students in the percentages. Noticeable differences are in the percentages who marked "careers course" and "friend" as influences.

Analysis of the data relating to number of students with and without industrial arts experience planning to enroll for the second year of the two-year trade and industrial education program or not planning to enroll showed no significant difference when chi-square was computed. When the type of industrial arts course experience was considered, the percentages varied only slightly from the percentage of those who had had any type of industrial arts course.

There was a significant difference in the number planning to enroll or not when size of the home high school was considered. A greater percentage of the students from larger high schools planned to enroll for the second year of their trade and industrial education program. Ninety per cent of the students in the large high schools were planning to enroll compared to 77.5 per cent for the medium-sized schools and 66.7 per cent of the students in small schools. Eighty-one per cent of all students who had taken any industrial arts course planned to enroll for the second year of their trade and industrial education program.

There was no significant difference in the numbers of students planning to enroll for a second year when compared by sex of the student.

The location of the trade and industrial education program did not affect the significance of the differences in number planning to enroll, not planning to enroll, and undecided.

The data from the study seems to indicate that size of the home high school is the primary factor that affects the influences on students and the related factors that prompt a student to enroll for the first time in a trade and industrial education program and to enroll for the second year of that program.

Conclusions

Based on this survey, the conclusion must be made that there is little association between industrial arts experience and trade and industrial education program enrollment. This is despite the fact that some educators have thought for years that there is a relationship. The contradiction found in the review of the literature continues directly to the results of this study.

One of the several purposes of industrial arts through the years has been guidance (State Industrial Arts Curriculum Committee and State Supervisor of Industrial Arts, 1979). Today the industrial arts/technology education programs have guidance, the assistance of all students to make meaningful occupational and educational choices, as an objective, as illustrated by Figure 2 on page 13 (State Industrial Arts Curriculum Committee and State Supervisor of Industrial Arts, 1979, Larson, 1969, London, 1970, Worthington, 1982, Stacy, 1985). Dyrenfurth (1984) and Stacy (1985) have emphasized the position of industrial arts as a recruitment means and the skills and knowledge from industrial arts that serve as a foundation for vocational education. Baker, et al, (1980) wrote that there is no method that currently exists "to measure the contribution of industrial arts to vocational education" (p. 1). These authorities on industrial arts are among the educators who have said that there is an association between industrial arts education and trade and industrial education.

Perhaps then it is necessary to accept the fact that there is no way to measure the contributions industrial arts education can make to vocational education. If there are significant contributions that industrial arts can make to vocational education, and those contributions can be

measured, this study did not accurately measure the contributions that industrial arts can make. Since this study did not reveal more of the significant factors, the assumptions of the study may have been incorrect.

The first assumption was that the students and programs were demographically representative of the trade and industrial students and programs in the state of Oklahoma. When selecting the schools, the students of which were to be surveyed, the researcher contacted administrators of one area vocational-technical school and one comprehensive high school who declined to participate. Because it was impossible to select other schools whose students were identical, some of the characteristics which might have varied were geographic, socio-economic, and educational background. These characteristics may have been factors in the sample's not being truly representative of the population.

Because of the nature of young people, all of those students who completed the survey instrument may not have answered completely honestly and to the best of their ability. They may have marked answers as they thought someone would want them to answer, or they may have copied answers someone else wrote, or they may have marked anything just to finish the task of answering the questions, without considering the importance of the task. However, the data does not appear to indicate this.

The third assumption was that students had been advised or counseled regarding courses they would have to complete the next year in order to graduate from high school and the likelihood that those courses and the trade and industrial program could all be taken during the school day. The students who failed to pass a particular course the second semester of their junior year would not necessarily have known of this failure. The second part of the assumption was that the students had decided

whether they would take the courses if the schedule allowed. The percentage of undecided for each category analyzed varied from 0 to 16.7 per cent, with 6.6 per cent of all students undecided about whether to enroll in the second year of their program.

The fourth, and final, assumption was that students knew whether they had taken industrial arts courses rather than other types of classes such as a vocational agriculture welding class or a coordinated vocational education and training (CVET) course. In reviewing the completed surveys, the researcher found that there were some who had written in a CVET or "ag" course, as an industrial arts course they had taken, despite the fact that students were given a description of industrial arts and cautioned about calling classes industrial arts when they were not industrial arts courses.

Because of these exceptions to the assumptions, the effect of the assumptions on the results of the study can be questioned.

Friends, parents, and a careers course were the influences on enrollment in a trade and industrial education program marked most often. This was true regardless of the type of industrial arts courses a student had completed.

An industrial arts teacher and an industrial arts course both influenced about 10 to 15 per cent of the students. An industrial arts course was an influence more frequently if at least one of the industrial arts courses was a general industrial arts course. However, the highest percentage (20.3 per cent) of students who had taken an industrial arts course and were not planning to enroll for a second year of their trade and industrial education program were those who had taken a general industrial arts course. Also, 10.8 per cent of the students who had had

general industrial arts still had not decided whether to re-enroll

Just under seven per cent of the students marked "career van" as an influence, giving "career van" the least influence. In light of the manpower effort and financial expenditure by the Oklahoma State Department of Vocational and Technical Education, the small response for the career van as an influence deserves some attention. The State Department of Vocational and Technical Education makes the career vans available to the students in many of the schools in the state. During the time the van visits a school certain teachers send their students to the career van to give the students information about possible careers for each student. Often the teachers who are responsible for sending their students are the English or history teachers. Because they have all the students in those classes, those teachers are also responsible for many other duties such as administering tests, sending students for yearbook pictures, and a myriad of other "housekeeping chores". The career van may be just another responsibility instead of an opportunity for developing career interest and awareness. Because of the attitude of the teachers, the visit to the career van may be just something the students feel they have to do, or just something to do to get out of class for the period. This attitude may directly affect the influence the career van can have on the student (Allen, 1986). The career van was a more important influence for the students in small schools than to students in larger ones. Eleven of the twenty-five students who marked "career van" were from the Western Oklahoma Area Vocational-Technical School.

Although the difference in plans to enroll for a second year of their trade and industrial education program is not statistically significant, the number of students intending to enroll for the second year of

a two-year program, among students who had taken an industrial arts course, was approximately 81 per cent compared to approximately 72 per cent of those students who had not taken in industrial arts course. These percentages are near the rate, 75 per cent, that Simmons (1979) reported enroll for a second year.

The size of the home high school made only slight differences in the factors selected as influences. A careers course and a friend ranked more important for students in small schools than in large schools. A careers course was not described in the survey instrument, but types of careers courses can vary from school to school and cause differing influences.

From personal observations by the researcher of schools throughout the state, a careers course may be an in-class textbook-studying situation. In other schools, the careers courses may function inside the classroom but have representative speakers from many career fields come into the classroom to speak to the students. Still other schools may utilize field trips so that students can observe persons in different occupations and the conditions under which they work. Other schools may provide a program whereby students actually try some of the work in an occupation. Options may be various combinations of these strategies for teaching young people about careers.

The difference may also be due to the fact that students in small schools are not exposed to as wide a range of influencing factors in the general public. This lack of exposure may account for a greater percent of students in small schools marking the factors that are available to influence them. The students in small schools, particularly in rural areas, are limited in the number of contacts they can make in the career fields.

The student from the rural areas, in the small school, have closer friends, though not as many, than the student in the larger schools. The closer friends may decide to go to the area vocational-technical school together. The friends of the parents may be friends of the students, particularly if there is a common interest. That friendship may result in the friend influencing the student to try a particular type of training.

The students in the larger high school have a larger group from which to choose their friends. This larger group probably consists of students who are the same age and older. Consequently, the student in the larger school may have more friends, but not as many close friends, who would or could encourage the student to train for a particular occupation. Also, a student may not be aware of the influence of a friend who is not a close friend.

The variation of re-enrollment plans by size of the high school was the only difference determined to be significant by the use of chi-square. Large schools have a better percentage of students who plan to re-enroll.

Sex is a factor two ways. First is the fact that so few females were enrolled in the trade and industrial programs, the second is that several of the females were in programs that admittedly have no relationship to industrial arts, particularly cosmetology. Even those students enrolled in interdisciplinary cooperative education (ICE) may be working in jobs that are in no way similar to industrial arts and most trade and industrial education programs. Those females who had taken an industrial arts course most often marked "careers course", "parent", and "friend" as influences. The differences in enrollment plans by sex were not significant.

The location of the trade and industrial program affected the findings very slightly. Where there was a difference, that difference was largely a reflection of the differences in the sizes of the home high schools the students attended.

Those 63 students (16.9 per cent of those who had taken an industrial arts course) who reported they were responsible for their own decision to enroll in a trade and industrial education program gave no indication of how they came to that decision. Because influence is often so subtle and indirect, students may not be aware they are being influenced. It is possible that the interest those 63 students had in an occupational area was encouraged and/or developed in an industrial arts course or by an industrial arts teacher.

Recommendations

Recommendations for further study of this topic include further refinement of the survey instrument for students and the development of a survey instrument for teachers of trade and industrial education programs. This survey instrument for the teachers should be designed to learn the teachers' opinions of any differences between those students who have and have not had industrial arts course, as well as compare the relative success of the two groups of students in the trade and industrial program.

The area of retention and dropouts in trade and industrial education programs should be a separate study. This study should utilize the records of the Oklahoma State Department of Vocational and Technical Education as well as the records from the area vocational-technical schools and home high schools. The students or former students should have the opportunity to give reasons for changing programs or dropping out of school.

The low rate of influence of the career van would seem to indicate that there should be a state-wide study of the effectiveness and efficiency of the mobile careers program in Oklahoma. Perhaps there is a better method for students to learn about their career possibilities.

A further recommendation for Oklahoma is that current industrial arts/technology education students be surveyed when they are enrolled in trade and industrial education programs to determine if the association between industrial arts enrollment and trade and industrial education programs is any greater.

Industrial arts teachers need to be more aware of the influence they and the course they teach can have on the students as the students prepare for an occupation. Teachers need to help students as they seek, consciously or unconsciously, to determine their occupational plans. Industrial arts teachers and trade and industrial education teachers need to work together to help the students prepare for the trade and industrial programs some of them will be taking during their junior and senior years of high school. Even those students not planning to enroll in a trade and industrial education program can benefit from the knowledge of safety procedures, problem-solving skills, and tool use developed in industrial arts courses.

The fact that this study did not show a significant association between a student's industrial arts experience and later enrollment in a trade and industrial education program does not refute the claims that have been made for industrial arts. Influence is often so indirect, so subtle, that a person does not realize that he or she is being influenced. The exploratory nature of the industrial arts/technology programs being developed and improved in the state of Oklahoma can help give the

students the job awareness they need to help them make the occupational decisions they need to make Industrial arts teachers need to accept the responsibility of teaching job awareness, just as they are beginning to accept the responsibility of teaching the "basics"

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APPENDIX A

LIST OF DESCRIPTORS USED IN ERIC SEARCH

LIST OF DESCRIPTORS USED IN ERIC SEARCH

Academic achievement
Academic failure
Attitudes
Correlation
Dropouts
Enrollment
Follow-up studies
Grade point average
Graduate surveys
Industrial arts
Industrial education
Perception
Persistence
Post-secondary education
Prevocational education
Questionnaire
Rating scales
Student characteristics
Surveys
Trade and industrial education
Vocational education
Vocational follow-up

APPENDIX B

INDUSTRIAL ARTS/TRADE AND INDUSTRIAL
QUESTIONNAIRE

INDUSTRIAL ARTS/TRADE AND INDUSTRIAL QUESTIONNAIRE

(School where you are enrolled in Trade and Industrial course)

(Home high school)

Please answer each question by marking the box below your answer or writing your answer in the blank to the left of the question

15	16	17	18	19	20	21	1	What is your age today?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	10		11		12		2	What grade are you in this year?
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	Male				Female		3	What is your sex?
	<input type="checkbox"/>				<input type="checkbox"/>			
	Area				Home		4	Is your trade and industrial (T&I) course in an area school or home high school?
	<input type="checkbox"/>				<input type="checkbox"/>			
<hr/>							5	What is the name of the T&I course in which you are enrolled?
	One		Two		Three		6	How many years have you been in this program?
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	Yes		No		?		7	Do you plan to take this course next year?
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	a		b		c		8	If not, why not? (Mark the box of each answer that applies)
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			a I am graduating this year
	d		e		f			b I am not graduating, but I am completing the program
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			c I am not graduating or completing the program, but I am not going to school next year
	g		h					d I don't have time in my schedule because I have to make up credits
	<input type="checkbox"/>		<input type="checkbox"/>					e I don't have time in my schedule because I need to take courses I have not yet taken to meet the requirements for graduation
								f I don't like working in this particular program
								g I want to take a different program
								h Other _____

An industrial arts course is one such as woods, drafting, or general shop in the home high school. It is usually one hour long. Industrial arts does not include vocational agriculture classes or "ag shops"

- Yes No 9 Have you taken an industrial arts course, such as those listed above or below in question 11, in an elementary, junior high, or senior high school? If yes, continue with the remaining questions. If no, you are ready to turn in your paper.
- 4 5 6 7 8 9 10 11 12 10 What grade(s) did you take industrial arts? (Mark the box for each grade you took industrial arts.)
- i j k 11 What type of industrial arts course(s) did you take? (Mark the box below the letter of each type you have had.)
- l m n i woods n electricity
j metals o printing
k drafting p general shop
l crafts q other _____
m welding
- Yes No 12 In the industrial arts course(s), did you learn any of the material you have covered in the T&I program?
- _____ 13 If yes, in which industrial arts course was it?
- Yes No 14 Did your industrial arts course(s) make the T&I course easier?
- r s t 15 Who or what from the list below influenced your decision to enroll in the T&I course? Mark all that apply.
- u v w r careers course
s career van
t industrial arts course
u industrial arts teacher
v other teacher
w counselor
x parent
y friend
z other _____

APPENDIX C

LETTER TO ADMINISTRATORS

Route 14, Box 82
Moore, Oklahoma 73165
May 9, 1985

Mr Charles Boyd, Director
Kiamichi AVTS, McAlester
P O Box 308
McAlester, Oklahoma 74502

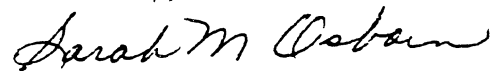
Dear Mr Boyd

Confirming our telephone conversation of this afternoon, I will be at your school before 8 20 Monday morning, May 13 I do appreciate your willingness to allow me to survey some of your high school trade and industrial students by means of a fifteen-item questionnaire I realize that time is short before school is out for the year

Many people feel that industrial arts students make better informed choices of trade and industrial programs than those students who have not had any industrial arts This, however, has never been tested, and this study is an attempt to begin to determine whether this is true

Again, I appreciate your help, and I trust that this survey can be done with as little disruption of the students' learning as possible

Sincerely,



Sarah M Osborn

APPENDIX D

LIST BY SIZE OF HIGH SCHOOLS WHOSE
STUDENTS WERE SURVEYED

SMALL HIGH SCHOOLS

Arapaho	Crowder	Liberty Mounds
Brooks	Dill City	Lone Wolf
Burns Flat	Eastwood	Merritt
Butler	Gotebo	Metro-Christian
Calvary Christian	Haileyville	Quinton
Calvin	Indianola	Sentinel
Canadian	Kiowa	Stuart
Canute		

MEDIUM-SIZED HIGH SCHOOLS

Berryhill	Harrah	Pawhuska*
Clinton	Hartshorne	Savanna
Collinsville	Hobart	Skiatook
Cordell	Holdenville*	Sperry
Elk City	Jones	Weatherford
Glenpool	Kingfisher*	Wilburton
Guymon*	Luther	

LARGE HIGH SCHOOLS

Bixby	East Central	Memorial
Broken Arrow	Edison	Nathan Hale
Catoosa	Jenks	Owasso
Central	Bishop Kelley	Union
Charles Page	McAlester	Webster
Choctaw	McLain	Will Rogers

*One of the four comprehensive high schools whose students were surveyed

VITA

Sarah Margaret Myers Osborn

Candidate for the Degree of

Doctor of Education

Thesis FACTORS WHICH DETERMINE THE INFLUENCE OF INDUSTRIAL ARTS ON
OTHER VOCATIONAL EDUCATION PROGRAMS

Major Field Occupational and Adult Education

Biographical

Personal Data Born in Fort Smith, Arkansas, March 18, 1940, the
daughter of Earl M and Goldie Myers Married to Ronald L
Osborn on November 8, 1960 Mother of two sons

Education Graduated from Fort Smith Senior High School, Fort Smith,
Arkansas, May, 1957, received Associate of Arts degree from
Westark Community College, May, 1959, received Bachelor of Arts
degree from Oklahoma Baptist University, May, 1960, received
Master of Science degree from Oklahoma State University, May,
1980, completed requirements for the Doctor of Education degree
at Oklahoma State University, May, 1986

Professional Experience Math Teacher, Sam Houston Junior High
School, Amarillo, Texas, August, 1960 to April, 1961, Math
Teacher, Madison Junior High School, Abilene, Texas, August,
1964 to May, 1965, Substitute Teacher, Moore Public Schools,
September, 1975 to October, 1977, Drafter, Star Manufacturing
Company, Oklahoma City, Oklahoma, October, 1977 to August, 1978,
Trade and Industrial and Industrial Arts Drafting and Math
Teacher, U S Grant High School, Oklahoma City, Oklahoma,
August, 1978, to May, 1984, Graduate Teaching Associate, Indus-
trial Arts Education, School of Occupational and Adult Education,
Oklahoma State University, August, 1984 to May, 1985, Industrial
Arts Drafting and Math Teacher, U S Grant High School,
Oklahoma City, Oklahoma, August, 1985 to present

Professional Organizations American Vocational Association,
Industrial Technology Education Association, Oklahoma Vocational
Association, Oklahoma Technology Education Association, Oklahoma
Technology Education Association Board of Directors, Phi Kappa
Phi, Kappa Delta Pi