

**AN ASSESSMENT OF DRAFTING PROGRAMS
IN MONTANA SECONDARY SCHOOLS**

by

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ABSTRACT

The purpose of this study was to assess the status of drafting programs in the public secondary schools of the state of Montana in order to establish a database for the future assessment of change.

Data was gathered through the use of a questionnaire designed to provide an overview of curriculum, enrollment, facilities, funding and the opinions of instructors about a proposed technology-based curriculum. The population for the study consisted of all 187 public secondary schools in the state of Montana with industrial arts programs. One hundred fifty-three schools, 81.8% of the study population, participated in the study by returning completed questionnaires.

The major conclusions of the study indicate that:

1. Drafting programs still play a viable role in the industrial/technology education programs of the state.
2. Instruction in drafting tends to be quite traditional in nature but there is clear evidence that some change is occurring to accommodate contemporary technology and philosophy.
3. Additional funding may be needed, especially in the small high schools and junior high schools, in order to upgrade facilities to accomplish curriculum goals.
4. A majority of the instructors (65.3%) support, in part at least, the philosophy of a technology based curriculum.

CHAPTER I

INTRODUCTION

In the state of Montana and throughout the nation, industrial arts is currently undergoing a period of self-evaluation and change. This change is the result of a continuing effort to update curriculum which began over thirty years ago when national leaders in the field of industrial arts such as Paul DeVore of West Virginia University, Donald Maley of the University of Maryland and others began to suggest that the structure and content of industrial arts was quickly becoming outdated with respect to the technology and needs of modern society.

Over the past thirty years the movement for change in industrial arts has taken several different directions. During the 1950's and 60's, pilot programs such as the Maryland Plan, the Industrial Arts Curriculum Project and the American Industry Program were developed at major universities in an attempt to update curriculum. These pilot programs, while similar to each other in the respect that each was based on the content of industry, were quite different from each other in structure and content. These differences resulted in a fragmented effort toward reform and today none of these programs are fully accepted by educators as a total solution to curriculum reform in industrial education.

During the late 1970's and early 1980's, movements for change in industrial education became much more radical than those of the early pilot programs. Responding to national studies such as A Nation at Risk (1983) and a call for more science and math education in our schools, many educators began to accept, at least in part, the philosophy for major changes in industrial arts, which has become known as the Jackson's Mill Industrial Arts Curriculum Theory (Hales, 1980). The Jackson's Mill curriculum theory was developed during a symposium at Fairmont State college in 1979 and calls for radical changes in both the structure and content of

industrial arts, changing it from a skills based study of industry to a conceptual based study of technology. The full impact of the Jackson's Mill symposium has yet to be realized but already national authorities in education such as Ernest Boyer are calling it a "remarkable document" (Boyer 1985, 6) and leaders in the field of industrial/technology education like Leonard Sterry of the University of Wisconsin-Stout "The most widely accepted organization of content since woodworking, metals and drafting" (Sterry 1986, 4).

In Montana, curriculum reform has been somewhat slower to develop than it has in some other states. In 1979 the Office of Public Instruction made it a requirement for state funding that all secondary schools incorporate into their industrial arts programs "occupationally oriented instruction in a series of occupational clusters" (Guidelines 1979, 40). This approach was similar to the cluster concept developed in the early 60's and adopted by numerous other states in the 70's. O.P.I. defined the occupational clusters to include the areas of communications, energy, materials and construction.

In 1985 the Office of Public Instruction distributed to all industrial education teachers in the state a Planning Guide for Montana Industrial Education/Technology Programs. This guide was developed by the Department of Agriculture and Industrial Education at Montana State University with a grant from O.P.I. and called for a change in the philosophy and content of industrial education from a skills based study of industry to a conceptual based study of technology.

In the 1985 Montana guide instructional content is grouped into four clusters: an introduction to technology, production, transportation and communications. The communications cluster, as defined in the guide, is based on the broad concepts of communications systems, i.e., human to human, human to machine, machine to machine, and machine to human communications systems. Despite these major changes of philosophy from those of the earlier programs in the communications cluster, the traditional subject content area of drafting still remains an integral part of the cluster, providing the subject content in which to learn the broad concepts of communications.

In Montana, drafting has always been the most widely offered area of instruction within the communications cluster. This fact is indicated in a study of Montana schools which was done in 1960 by James Olson, a graduate student at Montana State University. In this study Olson surveyed the small schools of Montana to assess what areas of instruction were being taught in industrial arts programs. One of the results of this study was that Olson found the only area of instruction offered at that time within the communications cluster was in the area of drafting (Olson, 1960).

As industrial arts in Montana begins to make changes toward a technology based curriculum we need to assess our current position in each of the various areas of industrial arts and gather data to establish a bench mark from which we can measure change. This study will provide this needed data for one of our oldest programs, the area of drafting.

Purpose of the Study

The purpose of this study is to assess the current status of drafting programs in the public secondary schools of the state of Montana in order to establish a database for the future assessment of change.

Need for the Study

During the past ten to fifteen years, concerted efforts have been made to update the industrial arts programs in the secondary schools of the state by both the Office of Public Instruction and the Department of Agriculture and Industrial Education at Montana State University. During this period, curriculum changes were developed and this information disseminated to the teachers of the state through regional workshops. Whether or not teachers are adopting these proposed changes however, has yet to be fully evaluated. A review of the related literature did not reveal any comprehensive studies which have been done in Montana in order to assess whether or not the proposed changes are being adopted.

In a telephone interview with Mr. Jeff Wulf of the Office of Public Instruction in March of 1987, Mr. Wulf stated that the Office of Public Instruction does not have any formal data to indicate whether or not school systems are adopting these proposed changes. Mr. Wulf went on to explain that the Office of Public Instruction has records for funding purposes which can identify what classes are being taught in each school, but these records only list class titles and are of limited value in determining what is actually being taught. In addition to this he stated the Office of Public Instruction has no record of those classes which are being taught but which did not apply for funding.

The review of the related literature also revealed that one of the last studies that was done in Montana which assessed the status of curriculum in industrial education that specifically addressed the area of drafting was done in 1960 by James Olson, a graduate student at Montana State University. In this study Olson surveyed the small schools of the state to assess what areas of instruction were being taught in their industrial arts programs.

In 1985 Scott Davis, a graduate student at Montana State University, conducted a study of the small schools in Montana. In this study Davis assessed the implementation of technology education in the small rural schools of the state but did not specifically address drafting or any other industrial arts program. In the recommendations of his study Davis suggested further studies be conducted in this area after the Planning Guide for Montana Industrial/Technology Education Programs was distributed.

In the neighboring state of Wyoming, a comprehensive study was done in 1985 to assess the curriculum of their industrial education programs. Ralph Borchers of the University of Wyoming conducted this study which gathered a wide range of information about their industrial education programs, including what specific areas of instruction were being taught in each school of the state (Borchers, 1985).

In order to assess what changes are occurring in the industrial education programs of the state, Montana needs to periodically assess the status of each of its programs and gather data to

establish bench marks from which change can be measured. Since an assessment of this nature is a very extensive project, data could be gathered from a single area of instruction which is taught in most of the schools of the state, such as drafting, and use this data to provide a general indication of the status of industrial arts programs and movements toward the proposed curriculum changes.

Objectives of the Study

The specific objectives of this study are as follows:

1. To assess what number of the public secondary schools in the state of Montana with industrial arts programs offer instruction in the area of drafting.
2. To assess at what levels of the educational system, instruction in drafting is being offered.
3. To assess what specific areas of instruction are currently being taught in the drafting programs of the state.
4. To assess the status of the curriculum, facilities, funding, staffing, enrollment and administrative support in the drafting programs of the state.
5. To assess the opinions of drafting instructors about movements in industrial arts education to change curriculum to a conceptual based study of technology.

Assumptions of the Study

The following assumptions were made for purposes of this study:

1. That all participants in the study were aware of the curriculum changes proposed in Planning Guide for Montana Industrial Education / Technology Programs.
2. That all participants in this study were either drafting teachers or industrial education department members familiar with the drafting program of their school.
3. That all participants in this study were as truthful and accurate as possible in responding to the survey questions.

Limitations of the Study

This study contains the following limitations:

1. This study was limited to the public secondary schools in the state of Montana with industrial arts programs as listed by the Office of Public Instruction 1987 Directory of Industrial Education Programs.
2. The specific areas of the drafting programs of the state which were assessed in this study were limited to those areas identified in the objectives of the study.

Definition of Terms

For purposes of this study the following terms will be defined as follows:

Industrial Arts - Those phases of general education which deal with industry, its organization, materials, occupations, processes and products; and with problems resulting from the industrial and technological nature of society (Curriculum Guide 1978, 2).

Industrial Education - A generic term which includes those programs which deal with industry and industrial related processes. This term encompasses industrial arts, trades and industrial education and technical education (Curriculum Guide 1978, 2).

Junior High Schools - All public secondary schools with grades 7 and 8 instructional programs which were not included in the two high school classifications.

Large High Schools - Those schools which are classified by the 1986-87 Montana High School Association Athletic Directory in basketball as class AA and class A.

Small High Schools - Those schools which are classified by the 1986-87 Montana High School Association Athletic Directory in basketball as class B and class C.

Technology - The utilization of acquired knowledge, science, tools, materials and processes which humans employ to control their evolutionary process (in nature and in the human-made environment), and to solve the problems related to society (Gilberti 1983, 15).

Technology Education – A comprehensive, action program concerned with technical means, their evolution, utilization and significance; with industry, its organization, personnel, systems, techniques, resources, and products; and their social/cultural impact (ITEA 1985, 25).

Communications Technology Education – Those aspects of technology education associated with communications systems, resources and processes and their social/cultural impacts.

CHAPTER II

REVIEW OF RELATED LITERATURE

Historical Overview of Curriculum Development in Industrial Arts

The advent of change in industry and technology in the post world war II era set the stage for the change of focus in industrial arts from educating to live in an industrial society to teaching to live in an age of information processing and technological change (Sanders 1985, 27).

An early effort at curriculum reform in response to the need to update industrial arts curriculum was the "Curriculum to Reflect Technology" of William E. Warner and a group of graduate students at Ohio State University in 1946-47 (Phillips 1985, 17). This curriculum proposal sought to broaden the industrial arts curriculum from the conventional unit shop class to a more general technological education in which curriculum was divided into five areas: manufacturing, communications, management, power and transportation (Starkweather 1979, 68). This new concept in curriculum served as a prototype from which were derived the innovative, technology education programs of the following decades such as those of Gordon O. Wilber, 1948; Delmar Olson, 1963; Donald Lux, et. al., 1966; Paul Devore, 1967; Donald Maley, et. al., 1973 (Householder 1979, 120-123).

The decade of the 1960's was the beginning of a nation-wide, fundamental re-examination of the functions, purposes and content of industrial arts education (Householder 1979, 114). During this period, curriculum development efforts were primarily centered around the functions of industry and several programs were developed, each using a slightly different approach to the content of the industrial system. Two of the more notable projects which were developed during this period were the Industrial Arts Curriculum Project and the American Industry Project (Householder 1979, 116-117).

The highlight of the 1970's was a focus of attention toward two content derivations, technology-based industrial arts and the cluster concept. The proponents for a technology based curriculum were numerous; Towers, Lux and Ray (1966) found that technology is a rational basis for industrial arts curriculum. Brown (1973) argued that technology provided an emphasis for most of the dominant practices of industrial arts. DeVore (1973) and Maley (1973) stated that the technology base provided the mechanism for industrial arts to be relevant for both society and the individual. The movement for a technology based curriculum continued to grow during the 1970's with several states, one of which was Virginia, adopting the concepts of a technology based curriculum in their state curriculum guides (Ziegler 1979, 175).

The second major content emphasis of the 70's was the use of content clusters. A content cluster was defined as "a classification system to arrange information and processes into classes or groups by a systematic process according to similarities on specified variables" (Ziegler 1979). This approach to the organization of content in industrial arts gained wide acceptance during the 70's but was also characterized by a dilemma, the lack of a consensus on cluster titles and content. (Martin 1979, 461).

In the late 1970's and early 1980's new forces began to influence the development of curriculum in industrial arts and other areas of the public education system. These forces were a public criticism of the nations school systems and a concern that our schools were not adequately meeting the needs of our youth (Jones 1986, 21). National studies such as a Nation at Risk (1983) prompted many of these critics to call for a "back to the basics" movement, but others began to see instead a need for "new basics." In industrial arts education many began to see this need for a new basics as a call for technological literacy. Ernest Boyer in his book High School: A Report on Secondary Education in America stated that "the great urgency is not for computer literacy but technological literacy" (Boyer 1983).

The most significant event of this period in terms of industrial arts curriculum development was what has become known as the Jackson's Mill Curriculum Theory Symposium

held at Fairmont State College in 1979. In this symposium leaders in the field of industrial arts identified the components of a curriculum which calls for radical changes in both the structure and content of Industrial Arts. In the Jackson's Mill theory Hales and Jones (editors) identify the three major human adaptive systems which society must put into force as it evolves: ideological, sociological and technological. They also identify the three domains of formal knowledge: sciences, humanities and technologies. The theory explains the interaction of the domains of knowledge and human adaptive systems and in so doing builds a strong case for the need for technological literacy and a technology based curriculum in industrial arts (Hales 1980).

Curriculum Development in Montana

The development of industrial arts curriculum in the state of Montana somewhat parallels the national pattern of development but until recently lagged behind some other states in the implementation of these curriculum changes. Prior to the late 1960's curriculum was mostly patterned after traditional curriculum models and in many cases closely allied with vocational agriculture. A study by James Olson in 1960 revealed that the basic curriculum of industrial arts in the small schools of Montana was centered around general woodworking, drafting, metals and crafts (Olson 1960).

In the mid 1970's the Office of Public Instruction adopted the cluster concept for curriculum development and in 1979 made it a requirement for funding that all secondary schools incorporate into their industrial arts programs occupational instruction in a series of occupational clusters. These clusters were defined to include the areas of communications, energy, materials and construction (Guidelines 1979).

In a 1983 Critical Issues Paper titled Information Technology: Its Impact On an Implications For Education in Montana, John Kohl, Lee VonKuster and Robert Newlon identified the need for school systems in Montana to utilize technology in the classroom (Kohl et. al. 1983, 5).

In 1985 the Office of Public Instruction distributed to all industrial arts teachers in the state a Planning Guide for Montana Industrial Education/Technology programs. This guide was developed by the Department of Agriculture and Industrial Education at Montana State University with a grant from the Office of Public Instruction and calls for the development of a technology-based curriculum in Montana industrial arts programs (Planning Guide 1985). Designed as an instrument to help industrial educators plan, manage and evaluate their programs the guide lists five technology oriented goals:

1. Establish beliefs and values based on the impact of technology and how it alters environments.
2. Develop attitudes and abilities in the proper use of the tools, techniques and resources of technical and technological systems.
3. Develop creative solutions to present and future societal problems using technical means.
4. Understand and appreciate the evolution and relationships of society and technical means.
5. Explore and develop human potentials related to responsible work, leisure and citizenship roles in a technological society (Planning Guide 1985, 4).

Drafting as a Technology Based Curriculum

The communications cluster continues to be an integral part of subject content in both the Jackson's Mill Curriculum Theory and the Montana plan for a technology based curriculum in industrial education. Within the communications cluster, drafting continues to be a vital segment of the subject content through which the goals of communications technology can be taught (Planning Guide 1985).

A communication system is a way to transfer information in order to extend human potential so that human senses can function beyond their natural state. The heart of a communications system is controlled by an information processing network known as the communications process. Communications technology is the application of technical means to communications systems (Ritz 1982).

In their publication "Resources in technology", Tidewater Technology Associates an educational consulting group, structure communications technology into four subsystems:

1. Technical graphics (drafting and design)
2. Graphic communications (printed graphics)
3. Electronic communication
4. Static devices (bells, mechanical clocks, etc.) (Tidewater Tech. Assoc. 1986)

In the technical graphics subsystem (drafting) the development of technology and specifically the development of micro-computers and computer assisted drafting and design (CADD) software has had significant impact on the development of curriculum.

Because of this technology many believe that drafting will evolve into a more academic field than it presently is with less emphasis on manual skills and more emphasis on problem solving and design (Schwendau 1986).

If traditional drafting programs are to make a successful transition to a technology based curriculum several problems have to be overcome. Mark Schwendau in his 1986 article "What the Future May Hold for the Field of Drafting" listed five of these problems as:

1. Students must continue to have the opportunity to take drafting as an elective class.
2. The shortage of qualified instructors who are trained in the use of technology must be addressed.
3. Funding must be increased in order to keep abreast with current technology.
4. Drafting must horizontally articulate with courses in other academic areas.
5. Drafting instructors must become more vocal about the benefits of their area. (Schwendau 1986)

Summary

During the past 30 years the field of industrial arts education has undergone many changes in philosophy and subject content. These changes were the result of a realization that traditional

curriculum in industrial arts was no longer meeting the needs of industry and society.

Movements for curriculum reform during the 1950's and 1960's were primarily centered around the functions of industry. Several pilot projects were developed during this period, each with a slightly different approach to the content and functions of industry but none of them gained universal acceptance.

During the decade of the 1970's curriculum development focused on two content derivations, a technology-based curriculum and the cluster concept. Both of these movements gained wide acceptance but the movement for a technology-based curriculum became the most widely accepted philosophy in the 1980's.

In Montana, curriculum reform has been patterned to a large degree after the national trends, and today is making a concerted effort to adopt a technology-based curriculum.

Throughout the history of curriculum reform the traditional subject area of drafting has continued to play a vital role in most industrial arts programs and is today, still an important segment of subject content in a technology-based curriculum.

CHAPTER III

METHOD OF PROCEDURE

Introduction

The purpose of this study was to assess the current status of drafting programs in the public secondary schools of Montana in order to establish a database for the future assessment of change. The descriptive method of educational research was chosen to make this assessment because the nature of the problem required that data be collected from a select population with respect to several variables. Data for the study were collected through the use of a questionnaire which was mailed to each of the public secondary schools in the state which have industrial arts programs. The responses of the returned questionnaires were tabulated to provide an overview of the current status of these programs.

Selection of the Study Population

This study was conducted using the total population of Montana public secondary schools with industrial education programs. This consisted of 187 schools most of which were high schools and junior high schools but also included some middle schools with grades 7 and 8 industrial arts programs. Secondary schools with industrial arts programs were identified through the use of the Office of Public Instruction 1986-87 Directory of Industrial Education Programs.

Development of the Questionnaire

Data for this study was collected through the use of a questionnaire designed by the researcher. The review of related literature revealed two studies of particular interest and value in the development of the questionnaire. The first of these studies was The Second Annual Survey

of Industrial, Technical and Vocational teachers conducted in 1986 by the International Technology Education Association and Virginia Polytechnic Institute and State University (Dugger, et. al., 1986). The second study was The Status of Industrial Arts Education and Demographics of Industrial Arts Teachers in Wyoming Secondary Schools by Ralph Borchers of the University of Wyoming in 1986 (Borchers, 1986).

In April 1987, the questionnaire and a cover letter explaining the purpose of the study were checked for construct validity by a panel of 11 industrial education teachers. This panel consisted of those teachers who were in attendance at the April 1987 Regional Industrial /Technology Education Workshop in Whitefish, Montana, sponsored by O.P.I. and Montana State University. Participants were asked to fill out a questionnaire by responding to the questions as they applied to the drafting programs in their respective schools. Participants were encouraged to make written comments with respect to construct validity, the clarity of the questions, the choice of responses and any other potential problems which they perceived. Several minor changes were suggested by the panel most of which were concerned with the wording of questions and responses.

The questionnaire was revised to reflect the changes suggested by the validation study panel and reproduced along with the cover letter in the form of a single sheet folded tabloid. (See appendix A)

Data Collection

The collection of data for this study followed a carefully planned sequence of steps and a strict time table in order to maximize participant response.

On April 24, 1987 the questionnaire and a pre-addressed post paid return envelope were mailed to the 187 secondary schools in the study population. Names and addresses for the mailing were identified through the use of the 1986-87 O.P.I. Directory of Industrial Education programs. Schools in the directory which did not list a drafting instructor by name were addressed "Drafting Instructor or Industrial Arts Department Head ". Participants were asked to respond to the questionnaire and return it to the researcher by May 8, 1987.

The returned questionnaires were identified by the school name listed in response to question number 13 of the questionnaire or the return address and postmark cancellation and recorded into a computer data base program. This first mailing of the questionnaire resulted in 121 responses.

On May 14, 1987 the 66 schools who did not respond to the first questionnaire were sent a second questionnaire along with a note asking for their participation. This second mailing produced an additional thirty two responses.

The combined returns of the two mailings resulted in 153 responses for an 81.8% return.

Data Tabulation

The results of the data obtained in this study were tabulated and are presented in Chapter IV of this study.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

In this chapter the data collected in this study is presented and statistically analyzed. In order to simplify the tabulation of results and provide meaningful statistical values, data is grouped into three categories: (1) responses from large high schools, (2) responses from small high schools and (3) responses from junior high schools. For purposes of this study, large high schools will be considered as those schools listed by the Montana High School Association 1986-87 Athletic Directory in basketball as class AA and class A. Small high schools will be considered as those schools listed in the same directory as class B and class C. The junior high classification will be considered as those schools which did not indicate instruction beyond grade nine and were not included in the large or small high school classifications. The junior high schools are grouped together without respect to school size. The term junior high will be used to describe both middle school and junior high school programs.

Participant response to the questionnaire was for the most part complete and accurate. Some participants however did not answer all of the questions on their questionnaire and in some cases the responses given by the participant could not be considered valid because the participant did not properly follow the directions when responding to the question. These questions with invalid or incomplete responses were omitted when tabulating the results of the survey.

In reporting the results of this survey all statistics are calculated using the total number of schools in a given classification that responded to each question and all percentages are rounded off to the nearest one tenth of one percent. The actual number of schools responding to a given question is indicated by the letter N in the tabulation of the results.

Results of the Questionnaire

Results of the Questionnaire Mailings

The population for this study consisted of all 187 public secondary schools in the state of Montana with industrial arts programs. The first mailing of the questionnaire resulted in 121 returns for a response of 64.7%. A second mailing of the questionnaire to the 66 schools which did not respond to the first mailing resulted in 32 returns for an additional 17.1% response. Combining the results of the two mailings yielded a total of 153 responses for an 81.8% return. A complete list of the schools which returned questionnaires and therefore participated in this study is presented in Appendix B. A breakdown of returns by school classification is presented in Table 1.

Table 1. Results of the Questionnaire Mailings.

School Classification	Schools Contacted to Participate in the Study								
	<u>1st Mailing</u>			<u>2nd Mailing</u>			<u>Combined Mailings</u>		
	No. Contact	No. Return	%	No. Contact	No. Return	%	No. Contact	No. Return	%
Large High Schools	34	27	79.4	7	2	5.9	34	29	85.3
Small High Schools	112	67	59.8	45	22	19.6	112	89	79.5
Junior High Schools	41	27	65.8	14	8	19.5	41	35	85.4
All Classifications	187	121	64.7	66	32	17.1	187	153	81.8

Results of Question Number One.

Question number one of the questionnaire asked "Does your industrial arts/ technology education department teach any courses or units of study in drafting?" Participants were asked to respond by indicating whether or not they offered instruction in drafting and whether this instruction is offered as a unit of instruction within another course or as one or more courses. All 153 of the participating schools responded to this question, with some schools responding that they teach drafting as both a unit in another course and as one or more courses.

Twenty-nine large high schools responded to this question with 1 school (3.4%) reporting that they do not offer any drafting, 5 schools (17.3%) offering it only as a unit within another course, 19 schools (65.5%) as one or more courses and 4 schools (13.8%) as both a unit within another course and one or more courses. In the small high schools, 10 schools (11.2%) of the 89 schools responding to this question do not offer any drafting, 38 schools (42.8%) only as a unit within another course, 32 schools (35.9%) as one or more courses and 9 schools (10.1%) as both a unit within another course and one or more courses. In the junior high schools, 5 schools (14.3%) of the 35 schools responding to this question do not teach any drafting, 21 schools (60%) only as a unit within another course, 9 schools (25.7%) as one or more courses and no schools as both units within another course and one or more courses.

A comparative summary of this data is presented in table two.

Table 2. Schools Which Offer Instruction in Drafting.

School Classification	N	Instruction Offered As							
		No Instruction Offered		A Unit Within Another Course		One or More Courses		Both Units and Courses	
		n	%	n	%	n	%	n	%
Large High Schools	29	1	3.4	5	17.3	19	65.5	4	13.8
Small High Schools	89	10	11.2	38	42.8	32	35.9	9	10.1
Junior High Schools	35	5	14.3	21	60.0	9	25.7	0	0
All Classifications	153	16	10.5	64	41.8	60	39.2	13	8.5

Results of Question Number Two.

Question number two of the survey asked participants, "At what grade levels of your IA/TE program do you offer instruction in drafting?" A total of 137 schools responded to this question with 28 responses from the large high schools, 79 responses from the small high schools and 30 responses from the junior high schools. In the large high schools drafting is offered by 5 schools (17.9%) in grade 7, 4 schools (14.3%) in grade 8 and 23 schools (82.1%) in grade 9. It should be noted however that most of the large high schools in this study are 3 year high schools,

so most of these schools do not have seventh, eighth and ninth grade students in their programs. In grades 10, 11 and 12 of the large high school programs drafting is offered by 26 schools (92.9%) in grade 10, by 28 schools (100.0%) in grade 11 and by 26 schools (92.9%) in grade 12.

In the small high schools drafting instruction is offered by 31 schools (39.2%) in grade 7, 38 schools (48.1%) in grade 8, 66 schools (83.5%) in grade 9, 55 schools (69.6%) in grade 10, 52 schools (65.8%) in grade 11 and 48 schools (60.8%) in grade 12.

In the junior high classification 24 schools (80.0%) offer instruction in drafting in grade 7, 28 schools (93.3%) in grade 8 and 4 schools (13.3%) in grade 9.

A comparative summary of this data is presented in table 3.

Table 3. Grade Levels in Which Drafting Instruction is Offered.

School Classification	N	Grade Level											
		7		8		9		10		11		12	
		n	%	n	%	n	%	n	%	n	%	n	%
Large H. S.	28	5	17.9	4	14.3	23	82.1	26	92.9	28	100.0	26	92.9
Small H. S.	79	31	39.2	38	48.1	66	83.5	55	69.6	52	65.8	48	60.8
Junior H. S.	30	24	80.0	28	93.3	4	13.3	0	0	0	0	0	0
All Classes	137	60	43.8	70	51.1	93	67.9	81	59.1	80	58.4	74	54.0

Note: Because instruction is offered in more than one grade level, percentages may total more than 100%.

Results of Question Number Three.

This question assessed the enrollment patterns in drafting programs during the past five years. Participants were asked to estimate the enrollment trends in their drafting program over the past five year period by selecting the statement from the answer choices which best described these trends.

Twenty-eight large high schools, 79 small high schools and 30 junior high schools responded to this question for a total of 137 responses. In the large high schools, 5 schools (17.9%) reported a constant enrollment, 7 schools (25%) a fluctuating enrollment, 4 schools (14.3%) a small increase in enrollment, 2 schools (7.1%) a large increase in enrollment, 5

schools (17.9%) a small decrease in enrollment and 5 schools (17.9%) a large decrease in enrollment. In the small high schools enrollment has remained constant in 29 schools (36.7%), fluctuated in 23 schools (29.1%), increased a small amount in 9 schools (11.4%), increased a large amount in 2 schools (2.5%), decreased a small amount in 11 schools (13.9%) and decreased a large amount in 5 schools (6.3%).

In the junior high programs enrollment was reported to be constant in 20 schools (66.7%), fluctuating in 3 schools (10%), increasing a small amount in 2 schools (6.7%), increasing a large amount in 2 schools (6.7%) and decreasing a small amount in 3 schools (10%). No schools in the junior high classification reported a large decrease in enrollment.

Table number four provides an overview of these estimates.

Table 4. Enrollment Patterns in Drafting Programs.

School Classification		Estimated Enrollment Patterns During the Past 5 Years.											
		Constant		Fluctuated		Small Inc.		Large Inc.		Small Dec.		Large Dec.	
	N	n	%	n	%	n	%	n	%	n	%	n	%
Large H. S.	28	5	17.9	7	25.0	4	14.3	2	7.1	5	17.9	5	17.9
Small H. S.	79	29	36.7	23	29.1	9	11.4	2	2.5	11	13.9	5	6.3
Junior H. S.	30	20	66.7	3	10.0	2	6.7	2	6.7	3	10.0	0	0
All Classes	137	54	39.4	33	24.1	15	10.9	6	4.4	19	13.9	10	7.3

Results of Question Number Four.

Question number four asked participants to indicate what specific areas of instruction they teach in their drafting program. Participants were asked to indicate these areas by selecting their responses from a list of 8 different area choices. A ninth or "other" choice was also included as an open-ended option to answering this question. Participants were also asked to indicate whether they teach these areas as a unit in another course, a separate course or two or more sequential courses.

Twenty-eight large high schools responded to this question. The data obtained from

these responses reveals that design is being taught as a unit in 13 schools (46.4%), as a single course in 1 school (3.6%) and as two or more sequential courses in 2 schools (7.1%). Mechanical drawing is taught as a unit in 10 schools (35.7%), as a single course in 12 schools (42.9%) and as two or more sequential courses in 7 schools (25%). Architectural drawing is taught as a unit in 6 schools (21.4%), as a single course in 12 schools (42.9%) and as two or more sequential courses in 8 schools. Engineering drawing is taught as a unit in 7 schools (25%), as a single course in 7 schools (25%) and as two or more sequential courses in 5 schools (17.9%). Descriptive geometry is taught as a unit in 13 schools (46.4%), as a single course in 2 schools (7.1%) and as two or more sequential courses in 2 schools (7.1%). Technical illustration is taught as a unit in 9 schools (32.1%), as a single course in 1 school (3.6%) and as two or more sequential courses in 2 schools (7.1%). Electrical/electronic circuit drawing is taught as a unit in 2 schools (7.1%), as a single course in 1 school (3.6%) and as two or more sequential courses in 1 school (3.6%). Computer assisted drafting and design (CADD) is taught as a unit in 12 schools (42.9%), as a single course in 1 school (3.6%) and as two or more sequential courses in 2 schools (7.1%).

Table five provides an overview of the results for the large high schools.

Table 5. Areas of Instruction in Large High School Drafting Programs.

Area of Instruction	Instruction Taught As					
	A Unit in Another Course		A Single Course		Two or More Sequential Courses	
	n	%	n	%	n	%
Design	13	46.4	1	3.6	2	.1
Mechanical Drawing	10	35.7	12	42.9	7	25.0
Architectural Drawing	6	21.4	12	42.9	8	28.6
Engineering Drawing	7	25.0	7	25.0	5	17.9
Descriptive Geometry	13	46.4	2	7.1	2	7.1
Technical Illustration	9	32.1	1	3.6	2	7.1
Elect. Circuit Drawing	2	7.1	1	3.6	1	3.6
Computer Assisted Drafting	12	42.9	1	3.6	2	7.1
Other	2	7.1	0	0	0	0

Note: Percents are based on 28 respondents and because of multiple responses may total more than 100%.

In the small high school classification 79 schools responded to this question. The data obtained reveals that design is being taught as a unit in 35 schools (44.3%), as a single course in 3 schools (3.8%) and as two or more sequential courses in 2 schools (2.5%). Mechanical drawing is taught as a unit in 42 schools (53.2%), as a single course in 33 schools (41.8%) and as two or more sequential courses in 6 schools (7.6%). Architectural drawing is taught as a unit in 19 schools (24%), as a single course in 20 schools (25.3%) and as two or more sequential courses in 9 schools (11.4%). Engineering drawing is taught as a unit in 6 schools (7.6%), as a single course in 9 schools (11.4%) and as two or more sequential courses in 1 school (1.3%). Descriptive geometry is taught as a unit in 16 schools (20.2%), as a single course in 2 schools (2.5%) and as two or more sequential courses in 1 school (1.3%). Technical illustration is taught as a unit in 9 schools (11.4%), as a single course in 2 schools (2.5%) and as two or more sequential courses in no schools (0%). Electrical/electronic circuit drawing is taught as a unit in 6 schools (7.6%), as a single course in 2 schools (2.5%) and as two or more sequential courses in no schools (0%). Computer assisted drafting and design (CADD) is taught as a unit in 6 schools (7.6%), as a single course in 9 schools (11.4%) and as two or more sequential courses in 2 schools (2.5%). A summary of this data from the small high schools is presented in table 6.

Data obtained in the junior high classification reveals that 30 schools responded to this question and that all drafting instruction, with the exception of mechanical drawing, is offered as a unit within another course. Five schools (16.7%) reported that mechanical drawing is offered as a single course and in 1 school (3.3%) as two or more sequential courses. Instruction in units were design, 8 schools (26.7%); mechanical drawing, 24 schools (80%); architectural drawing, 7 schools (23.3%); engineering drawing, descriptive geometry, technical illustration and electrical/ electronic circuit drawing each 1 school (3.3%) and computer assisted drafting and design (CADD), 6 schools (20%). Table 7 provides an overview of the data obtained in the junior high classification.

Table 6. Areas of Instruction in Small High School Drafting Programs.

Area of Instruction	Instruction Taught As					
	A Unit in Another Course		A Single Course		Two or More Sequential Courses	
	n	%	n	%	n	%
Design	35	44.3	3	3.8	2	2.5
Mechanical Drawing	42	53.2	33	41.8	6	7.6
Architectural Drawing	19	24.0	20	25.3	9	11.4
Engineering Drawing	6	7.6	9	11.4	1	1.3
Technical Illustration	9	11.4	2	2.5	0	0
Descriptive Geometry	16	20.2	2	2.5	1	1.3
Elect. Circuit Drawing	6	7.6	2	2.5	0	0
Computer Assisted Drafting	6	7.6	9	11.4	2	2.5
Other	0	0	1	1.3	0	0

Note: Percentages are based on 79 respondents and because of multiple responses will total more than 100%.

Table 7. Areas of Instruction in Junior High School Drafting Programs.

Area of Instruction	Instruction Taught As					
	A Unit in Another Course		A single Course		Two or More Sequential Courses	
	n	%	n	%	n	%
Design	8	26.7	0	0	0	0
Mechanical Drawing	24	80.0	5	16.7	1	3.3
Architectural Drawing	7	23.3	0	0	0	0
Engineering Drawing	1	3.3	0	0	0	0
Descriptive Geometry	1	3.3	0	0	0	0
Technical Illustration	1	3.3	0	0	0	0
Elect. Circuit Drawing	1	3.3	0	0	0	0
Computer Assisted Drafting	6	20.0	0	0	0	0
Other	7	23.3	0	0	0	0

Note: Percentages are based on 30 respondents and because of multiple responses will total more than 100%.

Results of Question Number Five.

Question number five of the questionnaire sought to determine how instructors perceived the strengths and weaknesses of their drafting programs. Participants were asked to rate their program strengths and weaknesses in six separate areas on a scale from very strong to very weak.

A five unit Linkert scale was then correlated to the response choices in order to facilitate a statistical analysis of the results. The six areas rated were funding, staffing, facilities, curriculum, enrollment and administrative support. One hundred thirty-three schools responded to this question of the survey: 28 large high schools, 78 small high schools and 27 junior high schools.

A statistical analysis of the data collected reveals that funding was rated in the large high schools with a mean value on the Linkert scale of 3.03 with a standard deviation of .88 compared to a small school mean of 2.79 with a standard deviation of .89 and a junior high rating of a 2.78 mean with a .93 standard deviation. Staffing was rated by the the large schools with a mean value of 3.5 with a standard deviation of .69, by the small schools with a mean value of 3.04 with a standard deviation of .75 and by the junior highs with a mean value of 3.18 with a standard deviation of .79. Facilities were rated with a mean value of 3.21 with a standard deviation of 1.13 by the large schools, with a mean value of 2.46 with a standard deviation of .91 by the small schools and with a mean value of 2.78 with a standard deviation of 1.01 by the junior highs. Curriculum ratings in the large schools had a mean value of 3.61 with a standard deviation of .74, in the small schools a mean value of 3.10 with a standard deviation of .78 and in the junior high schools a mean value of 3.22 with a standard deviation of .70. Enrollment ratings in the large schools had a mean value of 3.00 with a standard deviation of .98, in the small schools a mean of 2.88 with a standard deviation of .72 and in the junior highs a mean of 3.52 with a standard deviation of .64. Ratings of administrative support by the large schools had a mean of 3.36 with a standard deviation of 1.03, by the small schools with a mean of 3.08 with a standard deviation of .98 and by the junior highs with a mean of 3.48 with a standard deviation of .70. A breakdown of these results showing the number of responses for each of the five ratings is illustrated in table 8 for the large high schools, in table 9 for the small high schools and in table 10 for the junior high schools.

Table 8. Strengths and Weaknesses of Large High School Programs.

Area	5 VERY STRONG		4 STRONG		3 AVERAGE		2 WEAK		1 VERY WEAK		$\bar{X}$	SD
	n	%	n	%	n	%	n	%	n	%		
Funding	2	7.1	5	17.9	13	46.4	8	29.6	0	0	3.03	.88
Staffing	2	7.1	11	39.3	14	50.0	1	3.6	0	0	3.5	.69
Facilities	3	10.7	10	35.7	7	25.0	6	21.4	2	7.1	3.21	1.13
Curriculum	2	7.1	15	53.6	9	32.1	2	7.1	0	0	3.61	.74
Enrollment	2	7.1	5	17.9	14	50.0	5	17.9	2	7.1	3.00	.98
Admin. Support	4	14.3	8	28.6	11	39.3	4	14.3	1	3.6	3.36	1.03

Note: All statistical calculations are based on 28 respondents.

Table 9. Strengths and Weaknesses of Small High School Programs.

Area	5 VERY STRONG		4 STRONG		3 AVERAGE		2 WEAK		1 VERY WEAK		$\bar{X}$	SD
	n	%	n	%	n	%	n	%	n	%		
Funding	2	2.6	10	12.8	44	56.4	14	17.9	8	10.3	2.79	.89
Staffing	1	1.3	15	19.2	53	67.9	4	5.1	5	6.4	3.04	.75
Facilities	1	1.3	6	7.7	34	43.6	24	30.8	13	16.7	2.46	.91
Curriculum	2	2.6	19	24.4	45	57.7	9	11.5	3	3.8	3.10	.78
Enrollment	0	0	13	16.7	46	59.0	16	20.5	3	3.8	2.88	.72
Admin. Support	6	7.7	14	17.9	46	59.0	4	5.1	8	10.3	3.08	.98

Note: All statistical calculations are based on 78 respondents.

Table 10. Strengths and Weaknesses of Junior High School Programs.

Area	5 VERY STRONG		4 STRONG		3 AVERAGE		2 WEAK		1 VERY WEAK		$\bar{X}$	SD
	n	%	n	%	n	%	n	%	n	%		
Funding	1	3.7	3	11.0	15	55.5	5	18.5	3	11.0	2.78	.93
Staffing	2	7.4	4	14.8	19	70.4	1	3.7	1	3.7	3.18	.79
Facilities	1	3.7	5	18.5	11	40.7	7	25.9	3	11.0	2.78	1.01
Curriculum	1	3.7	7	25.9	16	59.3	3	11.0	0	0	3.22	.70
Enrollment	2	7.4	10	37.0	15	55.5	0	0	0	0	3.52	.64
Admin. Support	2	7.4	10	37.0	14	51.8	1	3.7	0	0	3.48	.70

Note: All statistical calculations are based on 27 respondents.

Results of Question Number Six.

This question asked "Do you use a text book in your drafting classes? How old are the text books you are currently using?" Participants were asked to indicate their responses from four choices: no text used, some or all texts are 1 to 3 years old, some or all texts are 4 to 6 years old and some or all texts are more than 6 years old.

In the large high school classification 28 schools returned valid responses to this question. Two schools (7.1%) reported that they did not use a text, 8 schools (28.6%) indicated that some or all texts were 1 to 3 years old, 11 schools (39.3%) indicated that some or all texts were 4 to 6 years old and 11 schools (39.3%) indicated that some or all texts were more than 6 years old.

In the small high school classification 78 schools returned valid responses to this question. Twelve schools (15.4%) reported that they did not use a text, 25 schools (32%) indicated that some or all texts are 1 to 3 years old, 20 schools (25.6%) indicated that some or all texts are 4 to 6 years old and 30 schools (38.5%) that some or all texts are more than 6 years old. In the junior high school classification 30 schools returned valid responses to this question. Eighteen schools (60%) reported that they do not use a text book, 4 schools (13.3%) that some or all texts are 1 to 3 years old, 2 schools (6.7%) that some or all texts are 4 to 6 years old and 8 schools (26.7%) that some or all texts are more than 6 years old.

A total of the results from all three classifications shows that: 32 schools (23.5%) do not use a text; in 37 schools (27.2%) some or all texts are 1 to 3 years old; in 33 schools (24.3%) some or all texts are 4 to 6 years old and in 49 schools (36%) some or all texts are more than 6 years old. A summary of these results are presented in table 11.

Results of Question Number Seven.

This question of the study was concerned with the assessment of opinions about curriculum. Participants were asked to rate their curriculum with respect to three choices: mostly consistent with current national trends and state guidelines; mostly traditional but changing towards

Table 11. Text Books Used in Drafting Classes.

School Classification	N	No Text Used		Ages of Some or all Texts Used					
				1 to 3 Yrs.		4 to 6 Yrs.		More than 6 Yrs.	
		n	%	n	%	n	%	n	%
Large High Schools	28	2	7.1	8	28.6	11	39.3	11	39.3
Small High Schools	78	12	15.4	25	32.0	20	25.6	30	38.5
Junior High Schools	30	18	60.0	4	13.3	2	6.7	8	26.7
All classifications	136	32	23.5	37	27.2	33	24.3	49	36.0

Note: Because multiple responses are possible, percentages may total more than 100%.

becoming more consistent with national trends and state guidelines and mostly traditional. One hundred thirty schools responded to this question with 28 large high schools, 73 small high schools and 29 junior high schools returning valid responses. A three unit Linkert scale was correlated with the response choices for the presentation of the data in order to facilitate an accurate statistical analysis.

An examination of the data reveals that in the large high schools 7 schools (25%) consider their curriculum to be mostly consistent with contemporary trends and current state guidelines, 8 schools (28.6%) mostly traditional but changing toward becoming more consistent with contemporary standards and 13 schools (46.4%) mostly traditional in nature.

In the small high schools, 6 schools (7.9%) feel that their curriculum is mostly consistent with current national trends and state guidelines, 25 schools (32.9%) mostly traditional but changing toward becoming more consistent with contemporary standards and 45 schools (59.2%) mostly traditional in nature.

In the junior high schools, 2 schools (6.9%) consider their curriculum mostly consistent with current national trends and state guidelines, 9 schools (31%) traditional but changing toward becoming more consistent with contemporary standards and 18 schools (62.1%) mostly traditional in nature.

A comparison of the mean and standard deviation Linkert scale values of the responses indicates a large high school mean of 1.79 with a standard deviation of .83, a small high school mean of 1.49 with a standard deviation of .64 and a junior high school mean of 1.45 with a standard deviation of .63.

Table 12 provides an overview of these results.

Table 12. Ratings of Drafting Curriculum.

		Curriculum Ratings							
School Classification	N	3		2		1		$\bar{X}$	SD
		n	%	n	%	n	%		
Large High Schools	28	7	25.0	8	28.6	13	46.4	1.79	.83
Small High Schools	73	6	7.9	25	32.9	45	59.2	1.49	.64
Junior High Schools	29	2	6.9	9	31.0	18	62.1	1.45	.63
All Classifications	130	15	11.3	42	31.6	76	57.1	1.54	.69

Results of Question Number Eight.

Question eight of this study sought to assess the opinions of instructors about the condition of their drafting room facilities. Participants were asked to rate the condition of their facilities according to a list of four possible responses: mostly modern state of the art, mostly older but in good condition and compatible with that used in industry, mostly good condition but outdated compared with that used in industry and mostly in need of replacement and outdated compared with that used in industry.

Responses from the large schools show that: 10 schools (34.5%) of the 29 schools responding to this question consider their facilities to be mostly modern state of the art, 10 schools (34.5%) older but compatible with that used in industry, 7 schools (24.1%) outdated but in good condition and 2 schools (6.9%) outdated and in need of replacement.

Data from the small high schools reveals that: 4 schools (5.5%) of the 73 schools which responded to this question consider their facilities to be mostly modern state of the art, 9 schools

(12.3%) older but compatible with that used in industry, 39 schools (53.4%) outdated but in good condition and 21 schools (28.8%) outdated and in need of replacement.

Results from the 28 junior high schools which responded to this question show that no schools consider their facilities to be state of the art, 2 schools (7.1%) to be compatible with those used in industry, 14 schools (50%) to be outdated but in good condition and 12 schools (42.8%) to be outdated and in need of replacement.

Using a 4 unit Linkert scale with a value of 4 considered to be modern state of the art, a comparison of ratings by classification can be made using the mean and standard deviation values. This comparison reveals that the large high schools rate their facilities with a mean value 2.69 with a standard deviation of .94, the small high schools a mean of 1.94 with a standard deviation of .79 and the junior highs a mean of 1.64 with a standard deviation of .62.

Table 13 provides a summary of these results.

Table 13. Drafting Program Equipment Ratings.

		Status of Equipment in Drafting Program									
		4		3		2		1			
School Classification	N	State of the Art		Compatible with Industry		Outdated but Good Condition		Outdated Needs Replacement		$\bar{X}$	SD
		n	%	n	%	n	%	n	%		
Large H. S.	29	10	34.5	10	34.5	7	24.1	2	6.9	2.96	.94
Small H. S.	73	4	5.5	9	12.3	39	53.4	21	28.8	1.94	.79
Junior H.S.	28	0	0	2	7.1	14	50.0	12	42.8	1.64	.62
All Classes	130	14	10.8	21	16.1	60	46.1	35	26.9	2.11	.92

Results of Question Number Nine.

This question of the study was designed to gather data about the computer hardware available to drafting programs within the industrial education department of their school. Participants were asked if their drafting program or IA/TE department owns any computer equipment. Responses were limited to three choices: (1) no, (2) yes, the drafting program owns one or more

computers and (3) yes, the IA/TE department owns one or more computers which all areas of the department share.

Results from the large high school show that of the 28 schools with valid responses to this question, 12 schools (42.9%) have no computers in the IA/TE department, 11 schools (39.3%) have one or more computers owned by the drafting program and 5 schools (17.9%) have one or more departmental computers shared by all areas of the department.

In the small high school classification, 89 valid responses were returned with 64 schools (71.9%) reporting that the IA/TE department did not own any computer equipment, 15 schools (16.9%) reported that their drafting program owns one or more computers and 10 schools (11.2%) that the IA/TE department owns one or more computers which all areas of the department share.

Thirty-four junior high schools returned valid responses to this question. Twenty-nine schools (85.3%) reported that their IA/TE department did not own any computer equipment, 3 schools (8.8%) that their drafting programs owns one or more computers and 2 schools (5.9%) that their IA/TE department owns one or more computers which all areas of the department share.

A summary of the data obtained from this question is presented in table 14.

Table 14. Computer Hardware in Drafting Programs.

School Classification	N	Computer Hardware in Drafting Programs					
		None		Drafting Owns One or More Computers		Drafting Uses Shared IA Dept. Computer(s)	
		n	%	n	%	n	%
Large High Schools	28	12	42.9	11	39.3	5	17.9
Small High Schools	89	64	71.9	15	16.9	10	11.2
Junior High Schools	34	29	85.3	3	8.8	2	5.9
All Classes	151	105	69.5	29	19.2	17	11.3

Results of Question Number Ten.

The purpose of this question was to determine what types of computer software are being used in those drafting programs with access to computer equipment. Participants were asked to indicate how both they (the instructors) and their students use computers in connection with their drafting program. Responses were limited to 5 software systems and a sixth "other" category. The choices of software systems were: word processing, computer assisted drafting and design (CADD), computer graphics, data base and spread sheet applications and computer assisted instruction (CAI).

A total of 44 schools returned valid responses to this question. A large number of invalid responses were also returned but not included in the data because the participants did not indicate whether the usage was by students, the instructor or both the students and the instructor. Of the 44 valid responses 11 were from the large high schools, 28 from the small high schools and 5 from the junior high schools.

Results from the large high schools indicate that computer usage in drafting programs by students includes word processing in 2 schools (18.2%), CADD in 10 schools (90.9%), computer graphics in 6 schools (54.5%) and CAI in 4 schools (36.4%). Student usage in small schools was reported as word processing in 14 schools (50%), CADD in 11 schools (39.3%), computer graphics in 9 schools (32.1%), data base or spread sheet applications in 6 schools (21.4%) and CAI in 12 schools (42.9%). The junior high schools reported student usage to include word processing in 1 school (20%), CADD in 2 schools (40%), computer graphics in 2 schools (40%) and CAI in 3 schools (60%).

Computer usage by instructors in the large high school drafting programs was reported as word processing in 7 schools (63.6%), CADD in 8 schools (72.7%), computer graphics in 4 schools (36.4%), data base or spread sheet applications in 6 schools (54.5%) and CAI in 7 schools (63.6%). Instructor usage in the small high schools was reported to be word processing

in 18 schools (64.3%), CADD in 6 schools (21.4%), computer graphics in 8 schools (28.6%), data base or spread sheet applications in 12 schools (42.9%) and CAI in 4 schools (14.3%). In the junior high classification the data indicates that drafting instructors use computers for word processing in 4 schools (80%), CADD in 3 schools (60%), computer graphics in 3 schools (60%), data base or spread sheet applications in 1 school (20%) and for CAI in 3 schools (60%). Two schools listed grade book records and one school listed tests and handouts as uses in the "other" category but these were put in with the data base and word processing responses. A summary of the responses to this question are presented in table 15 for student usage and table 16 for instructor usage.

Table 15. Student Usage of Computers in Drafting Programs.

School Classification		Software Used by Students											
		Word Processing				CADD		Graphics		Data Base or Spread Sheet		CAI	
		N	n	%	n	%	n	%	n	%	n	%	
Large H. S.	11	2	18.2	10	90.9	6	54.5	0	0	4	36.4		
Small H. S.	28	14	50.0	11	39.3	9	32.1	6	21.4	12	42.9		
Junior H.S.	5	1	20.0	2	40.0	2	40.0	0	0	3	60.0		
All Classes	44	17	38.6	23	52.3	17	38.6	6	13.6	19	43.2		

Note: Because of multiple responses percentages may total more than 100%.

Table 16. Instructor Usage of Computers in Drafting Programs.

		Software Used by Instructors									
School Classification	N	Word Processing		CADD		Graphics		Data Base or Spread Sheet		CAI	
		n	%	n	%	n	%	n	%	n	%
Large H. S.	11	7	63.6	8	72.7	4	36.4	6	54.5	7	63.6
Small H.S.	28	18	64.3	6	21.4	8	28.6	12	42.9	4	14.3
Junior H.S.	5	4	80.0	3	60.0	3	60.0	1	20.0	3	60.0
All Classes	44	29	65.9	17	38.6	15	34.1	19	43.2	14	31.8

Note: Because of multiple responses percentages may total more than 100%.

Results of Question Number Eleven.

Question number 11 of the questionnaire sought to assess the opinions of instructors about the current movements on both the state and national levels to revise curriculum in industrial arts from that of a skills based study of industry to that of a conceptual based study of technology. Participants were asked to respond by selecting one of 5 possible responses: (1) I strongly support the movement, (2) I support the movement but only in combination with a traditional curriculum, (3) I do not support the movement but feel that the traditional curriculum needs improvement, (4) I do not support the movement and feel that the traditional curriculum is meeting our needs, (5) I am undecided at this time.

The data obtained from the large high schools indicates that 1 school (3.4%) of the 29 schools that responded to this question strongly supports the movement, 19 schools (65.5%) support the movement but only in combination with traditional curriculum, 2 schools (6.9%) do not support the movement but feel traditional curriculum is inadequate, 2 schools do not support the movement and feel traditional curriculum is adequate and 5 schools (17.2%) are undecided about the movement at this time.

In the small high schools 10 schools (11.6%) of the 86 schools that responded to this question do not support the movement, 47 schools (54.6%) support the movement in combination with a traditional curriculum, 7 schools (8.1%) do not support the movement but feel that traditional curriculum is inadequate, 4 schools (4.6%) do not support the movement and feel that traditional curriculum is adequate and 18 schools (20.9%) are undecided about the movement at this time.

In the junior high schools 5 schools (15.6%) of the 32 schools that responded to this question responded that they strongly support the movement, 14 schools (43.7%) support the movement in combination with a traditional curriculum, 5 schools (15.6%) do not support the movement but feel that traditional curriculum is inadequate, 1 school (3.1%) does not support the movement and feels that traditional curriculum is adequate and 7 schools are undecided about the

movement at this time.

A summary of the data obtained from this question is presented in table 17.

Table 17. Opinions About Changes Towards A Technology Based Curriculum.

Opinions of Drafting Instructors											
School Classification	N	Strongly Support		Support in Combination With Traditional Curriculum		Do Not Support But Traditional Curriculum is Inadequate		Do not Support Traditional Curriculum is Adequate		Undecided	
		n	%	n	%	n	%	n	%	n	%
Large H. S.	29	1	3.4	19	65.5	2	6.9	2	6.9	5	17.2
Small H.S.	86	10	11.6	47	54.6	7	8.1	4	4.6	18	20.9
Junior H.S.	32	5	15.6	14	43.7	5	15.6	1	3.1	7	21.9
All Classes	147	16	10.9	80	54.4	14	9.5	7	4.8	30	20.4

Results of Question Number Twelve.

The purpose of this question was to assess the development of instruction in communications technology, which is one of the basic areas of instruction listed in the 1985 Planning Guide for Montana Industrial /Technology Education Programs. Participants were asked if they currently teach, or have plans to begin teaching, any classes or units of instruction in communications technology. The term communications technology was defined for the participants and responses were limited to three choices: (1) no; (2) yes, we are currently offering instruction in this area and (3) we plan to add this instruction in the near future.

An examination of the data obtained from the large high schools reveals that 15 of the 27 schools (55.6%) that returned valid responses to this question do not offer any instruction in this area. Six schools (22.2%) are currently offering some instruction in this area and 6 schools (22.2%) plan to add instruction in this area in the near future.

In the small high schools 86 schools returned valid responses to this question with 64 schools (84.8%) indicating that they do not offer any instruction in this area. Five schools (5.8%) indicated that they are currently offering some instruction in this area and 17 schools

(19.8) indicated that they plan to add this instruction in the near future. Thirty three junior high schools returned valid responses to this question. Twenty-eight schools (84.8%) indicated that they do not offer any instruction in this area. One school (3%) indicated that it currently offers some instruction in this area and 4 schools (12.1%) indicated that they plan to add instruction in this area in the near future.

Table 18 summarizes the data obtained from this question.

Table 18. Instruction in Communications Technology.

School Classification	N	Current Status of Instruction in Communications Technology					
		No Instruction Offered		Some Instruction Offered		Plan to Add Instruction In The Near Future	
		n	%	n	%	n	%
Large High Schools	27	15	55.6	6	22.2	6	22.2
Small High Schools	86	64	74.4	5	5.8	17	19.8
Junior High Schools	33	28	84.8	1	3.0	4	12.1
All Classifications	146	107	73.3	12	8.2	27	18.5

Summary

A summary of the data obtained in this study indicates the following facts:

1. Of the 187 schools in the study population, 153 schools (81.8%) participated in this study.
2. Drafting instruction is offered by 89.5 % of the schools participating in this study.
3. Drafting instruction is offered in most or all grade levels of the industrial arts programs of the schools that participated in the study.
4. Enrollment patterns have varied considerably from school to school.
5. Instruction in drafting is primarily centered around courses or units of study in mechanical, architectural, and engineering drawing.
6. Small high schools and junior high schools indicate more weaknesses in their programs than do the large high schools.
7. Drafting programs are using a wide age range of text books from those 1 to 3 years old to more

than 6 years old.

8. Curriculum and facilities range from contemporary state of the art to traditional and out dated but the majority of schools tend to have a curriculum which is quite traditional with older or out dated facilities.
9. Computer hardware in the drafting program is limited to 19.2% of the schools.
10. The concepts of a technology based curriculum are supported, in part at least, by 65.3% of the participants in this study with 20.4% reporting that they are undecided about the matter at this time.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to assess the status of drafting programs in the public secondary schools of the state of Montana in order to establish a database for the future assessment of change. The specific objectives of this study were:

1. To assess what number of public secondary schools in the state of Montana with industrial arts programs offer instruction in the area of drafting.
2. To assess at what levels of the educational system instruction in drafting is being offered.
3. To assess what specific areas of instruction are currently being taught in the drafting programs of the state.
4. To assess the status of curriculum, facilities, funding, staffing, enrollment and administrative support in the drafting programs of the state.
5. To assess the opinions of drafting instructors about movements in industrial arts education to change curriculum to a conceptual based study of technology.

The need for this study was identified from the information obtained in the review of related literature. This information indicated that industrial arts leaders throughout the nation are calling for the adoption of a technology based curriculum in industrial arts education. In Montana, concerted efforts have been made for the past 5 or 6 years to convince industrial arts teachers to adopt a proposed technology-based curriculum but no recent studies were found that evaluated whether or not these proposed changes have been implemented. It was decided that a study of the drafting programs in the state could provide an indication of the extent to which these proposed

changes are being adopted as well as provide a database to establish a bench mark for the future measurement of change.

The descriptive method of educational research was chosen for this study because of the nature of the information to be gathered. Data was obtained through the use of a questionnaire designed by the researcher which was mailed to the total population of Montana secondary schools with industrial arts programs. One hundred fifty-three (81.8%) of the 187 schools that were asked to participate in the study did so by returning completed questionnaires.

An examination of the data obtained in this study revealed that the objectives of the study were answered as follows:

Objective Number One—The data indicates that drafting is offered in 137 (89.5%) of the 153 schools which participated in the study.

Objective Number Two—The data indicates that most schools offer drafting in most or all grade levels of their industrial arts program.

Objective Number Three—The data indicates that most programs in drafting are centered around courses or units of study in mechanical, architectural and engineering drawing.

Objective Number Four—The data indicates that a majority of the schools (57.1%) rate their curriculum as being traditional with respect to current standards. Small high schools and junior high schools rate their facilities, funding and administrative support lower than the large high schools. Enrollment patterns and the age of text books used in drafting programs varied considerably in all three school classifications. Computers are owned by only 29 drafting programs (19.2%) of the schools that participated in the study.

Objective Number Five—The data indicates that the concepts of a technology based curriculum are supported, in part at least, by 65.3% of the instructors who participated in the study and that 20.4% of the instructors indicated that they are undecided about the matter at this time.

Conclusions

Upon reviewing the results of this study several conclusions might be drawn:

1. Drafting programs still play a major viable role in the industrial/ technology education programs of the secondary schools in Montana.
2. Instruction in the drafting programs of the state tends to be quite traditional in nature but there is clear evidence that some change is beginning to occur toward updating facilities and curriculum to accommodate contemporary technology and philosophy.
3. Additional funding might be needed, especially in the small high schools and junior high schools of the state, in order to upgrade facilities to accomplish curriculum goals.
4. A majority (65.3%) of the drafting teachers in the state support in part at least the philosophy of a technology based curriculum but a significant percentage (20.4%) remain undecided about the matter at this time.

Recommendations

In reviewing the results of this study the researcher would offer the following recommendations:

1. That future studies be undertaken in this area to measure the direction and rate of change as compared to those bench marks which were established by this study.
2. That efforts be continued to inform teachers about the rationale and philosophy of a technology based curriculum in industrial arts education.
3. That more effort be directed toward upgrading facilities in the small high schools and junior high schools in order to allow these schools to adopt a more contemporary curriculum.
4. That future studies be more specific in quantifying data in the areas of enrollment trends, the rating of curriculum and future curriculum plans.

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APPENDICES

APPENDIX A
SAMPLE COVER LETTER AND QUESTIONNAIRE



Montana State University
Bozeman, Montana 59717

Department of Agricultural and Industrial Education
College of Agriculture

Date: April 24, 1987
To: All Montana secondary school IA/TE drafting teachers
From: Glen Rintamaki, MSU graduate student and Bozeman Senior High IA/TE instructor
Re: Survey of IA/TE drafting programs

Dear colleague;

HELP! In a desperate attempt to complete my Masters program before the allotted time period runs out, I am conducting a survey of the industrial arts/ technology education drafting programs in the state of Montana. With the results of this survey I intend to gather enough data to formulate an accurate picture of the current status of our drafting programs and hope that this information can then be used by state planners when making decisions about our programs.

As a teacher myself, I know how limited your time is, especially at this time of the year, but please take a few minutes and fill out the attached questionnaire. It would be most helpful to me and to the future of our programs.

Please return the completed questionnaire in the enclosed self addressed envelope by May 2, 1987.

Thank you very much. I greatly appreciate your help.

Sincerely,

A handwritten signature in cursive script that reads "Glen Rintamaki".

Glen Rintamaki

IA/TE DRAFTING PROGRAM SURVEY

Directions - Please answer the following questions as they applied to your drafting program during the 86-87 school year. Mark all appropriate answers with an "X" unless directed to do otherwise in the question.

1. Does your industrial arts/technology education department teach any courses or units of study in drafting? (If your answer to this question is "No", please omit questions 2 through 8.)

- ☐ No.
☐ Yes, as one or more units of instruction as part of another course.
☐ Yes, as one or more courses.

2. At what grade levels of your IA/TE program do you offer instruction in drafting?

Grades: (7) _____, (8) _____, (9) _____, (10) _____, (11) _____, (12) _____

3. Which of the following best describes the enrollment pattern in your drafting program during the past 5 years?

- ☐ The enrollment has remained constant.
☐ The enrollment has fluctuated.
☐ The enrollment has increased by a small number.
☐ The enrollment has increased by a large number.
☐ The enrollment has decreased by a small number.
☐ The enrollment has decreased by a large number.

4. Which of the following areas do you teach in your drafting program? (Indicate whether these areas are taught as a unit within another course, a separate course or as two or more sequential courses.)

Area	As a unit in another course	As a single course	As two or more sequential courses
Design	_____	_____	_____
Mechanical drawing	_____	_____	_____
Architectural drawing	_____	_____	_____
Engineering drawing	_____	_____	_____
Descriptive geometry	_____	_____	_____
Technical illustration	_____	_____	_____
Electrical/electronic circuit drawing	_____	_____	_____
Computer assisted drafting/design	_____	_____	_____
Other (please describe)	_____	_____	_____

5. Please rate your drafting program's strengths and weaknesses according to the following criteria:

Area	Very strong	Strong	Average	Weak	Very weak
Funding	_____	_____	_____	_____	_____
Staffing	_____	_____	_____	_____	_____
Facilities	_____	_____	_____	_____	_____
Curriculum	_____	_____	_____	_____	_____
Enrollment	_____	_____	_____	_____	_____
Administrative Support	_____	_____	_____	_____	_____

6. Do you use a text book in your drafting classes? How old are the text books you are currently using?

- _____ No text is used. (Instruction is accomplished with the use of other materials.)
 _____ Some or all texts are 1 to 3 years old.
 _____ Some or all texts are 4 to 6 years old.
 _____ Some or all texts are more than 6 years old.

7. Please rate your drafting curriculum according to the following criteria:

- _____ Mostly consistent with contemporary national trends and current state guidelines
 _____ Mostly traditional but changing toward becoming more consistent with contemporary trends and state guidelines
 _____ Mostly traditional in nature

8. Please rate the condition of your drafting room equipment according to the following criteria:

- _____ Mostly modern state of the art (drafting machines, computers etc.)
 _____ Mostly older but in good condition and compatible with that used in industry
 _____ Mostly in good condition but outdated compared with that used in industry
 _____ Mostly in need of replacement and outdated compared with that used in industry

9. Does your drafting program or IA/TE department own any computer equipment?

- _____ No.
 _____ Yes, the drafting program owns one or more computers.
 _____ Yes, the IA/TE department owns one or more computers which all areas of the department share.

Please turn to the next page for the remaining questions

10. If your drafting program or IA/TE department owns or has access to computer equipment, how is that equipment being used in your drafting program? (Please mark an S for student use, an I for instructor use and an SI for both student and instructor use.)

- _____ For word processing
- _____ For computer assisted drafting/design (CADD)
- _____ For computer graphics
- _____ For data base or spread sheet applications
- _____ For computer aided instruction (CAI)
- _____ For other uses (please explain) _____

11. How do you feel about the movements on both the state and national levels to revise curriculum in industrial education from that of a skills based industry related program to that of a conceptual based study of technology?

- _____ I strongly support the movement.
- _____ I support the movement but only in combination with a traditional curriculum.
- _____ I do not support the movement but feel that the traditional curriculum needs improvement .
- _____ I do not support the movement and feel that the traditional curriculum is meeting our needs.
- _____ I am undecided at this time.

12. Does your IA/TE department currently teach or have plans to begin teaching, any classes or units of instruction in communications technology? (For this question, consider communications technology to be a study of the broad concepts of communications systems, resources and technical processes and how they affect and influence modern society.)

- _____ No.
- _____ Yes, we currently offer instruction in this area.
- _____ We plan to add this instruction in the near future.

13. What is the name of your school? (This question is optional.)

THANK YOU VERY MUCH.
YOUR PARTICIPATION IN THIS SURVEY IS GREATLY APPRECIATED!

APPENDIX B
STUDY PARTICIPANTS

STUDY PARTICIPANTS

Large High Schools

Billings Career Center
3723 Central Ave.
Billings, MT 59102

Billings Senior High School
425 Grand Ave.
Billings, MT 59102

Billings West High School
2201 St. Johns
Billings, MT 59201

Skyview High School
2911 Fourth Ave. North
Billings, MT 59102

Bozeman Senior High
205 N 11th Street
Bozeman, MT 59715

Butte High School
Wyoming & Porphyr
Butte, MT 59701

Colstrip High School
5000 Pine Butte Drive
Colstrip, MT 59323

Columbia Falls High School
610 13th St. West
Columbia Falls, MT 59912

Beaverhead Co. High School
104 N. Pacific St.
Dillon, MT 59725

Glasgow High School
Highlands Addition
Glasgow, MT 59230

Dawson Co. High School
Box 701
Glendive, MT 59930

C. M. Russell High School
228 17th Ave. NW
Great Falls, MT 59404

Great Falls High School
1900 2nd Ave. South
Great Falls MT 59405

Hamilton High School
Box 980
Hamilton, MT 59840

Havre High School
900 18th Street
Havre, MT 59501

Capital High School
100 Valley Drive
Helena, MT 59601

Helena High School
1300 Billings Ave.
Helena, MT. 59601

Flathead High School
644 4th Ave. West
Kalispell, MT 59901

Laurel High School
203 East Eighth
Laurel, MT59044

Fergus Co. High School
412 6th Ave South
Lewistown, MT.59457

Large High Schools

Libby High School
RT 3 Skidale
Libby, MT 59739

Park High School
McLeod Island
Livingston MT 59047

Custer Co. High School
20 South Center Street
Miles City, MT 59301

Big Sky High School
3100 South Ave. West
Missoula, MT 59801

Hellgate High School
900 South Higgins
Missoula, MT 59801

Sentinel High School
901 South Ave. West
Missoula, MT 59801

Polson High School
111 4th Ave. East
Polson, MT 59860

Sidney High School
South Central Ave.
Sidney, MT 59270

Whitefish High School
East 4th Street
Whitefish, MT 59937

Small High Schools

Alberton High School
Box 118
Alberton, MT 59820

Arlee High School
Box 37
Arlee, MT 59821

Baker High School
Box 659
Baker, MT 59313

Sweet Grass Co. High School
Box 886
Big Timber, MT 59011

Big Fork High School
Box 188
Big Fork, MT 59911

Swan River School
1205 Sean Hwy
Big Fork MT 59911

Jefferson High School
312 South Main
Boulder, MT 59632

Box Elder High School
Box 205
Box Elder, MT 59521

Powder River Co. District H.S.
Box 500
Broadus, MT 59317

Broadview High School
Box 106
Broadview, MT 59015

Brockton High School
Box 198
Brockton, MT 59213

Browning High School
Box 610
Browning, MT 59417

Small High Schools

Charlo High School
Box 5
Charlo, MT 59824

Chester High School
Box 550
Chester, MT 59522

Choteau High School
204 7th Ave. NW
Choteau, MT 59523

Circle High School
Box 99
Circle, MT 59215

Conrad High School
215 S. Maryland
Conrad, MT 59425

Corvallis High School
Box 133
Corvallis, MT 59828

Cut Bank High School
300 1st Street South East
Cut Bank, MT 59427

Darby High School
North Main St.
Darby, MT 59829

Powell Co. High School
709 Missouri Ave
Deer Lodge, MT 59722

Dodson High School
Box 278
Dodson, MT 59524

Drummond High School
Box 349
Drummond, MT 59832

Madison Valley Cons. High School
Box 517
Ennis, MT 59729

Lincoln Co High School
Box 2000
Eureka, MT 59917

Fairfield High School
Box 99
Fairfield, MT 59436

Flaxville High School
400 1st Ave.
Flaxville, MT 59222

Florence Carlton High School
5540 Old Hwy 93
Florence, MT 59833

Forsyth High School
917 Park
Forsyth, MT 59327

Frazer High School
Box 488
Frazer, MT 59225

Gardiner High School
Box 26
Gardiner, MT 59030

K-O High School
Box 166
Gildford, MT 59525

Grass Range High School
Box 47
Grass Range, MT 59032

Harlem High School
Box 339
Harlem, MT 59526

Small High Schools

Harrison High School
Box 7
Harrison, MT 59735

Hays Lodge Pole High School
Box 880
Hays, MT 59527

Highwood High School
Box 100 RR1
Highwood, MT 59450

Hot Springs High School
Drawer T
Hot Springs, MT 59845

Joliet High School
Box 6
Joliet, MT 59041

J-I High School
Box 227
Joplin, MT 59531

Garfield Co High School
Box 409
Jordan, MT 59337

Lambert High School
Box 236
Lambert, MT 59243

Lima High School
Box AA
Lima, MT 59739

Lincoln High School
Box 154
Lincoln, MT 59639

Lodge Grass High School
124 N. George
Lodge Grass, MT 59050

Malta High School
219 S. 5th St. East
Malta, MT 59538

Manhattan High School
405 N. Broadway
Manhattan, MT 59741

Pine Hills School
Miles City, MT 59301

Moore High School
Box 1
Moore, MT 59466

Nashua High School
Box 167
Nashua, MT 59248

Noxon High School
Box 1506
Noxon, MT 59853

Opheim High School
Box 108
Opheim, MT 59250

Outlook High School
Box 296
Outlook, MT 59252

Granite High School
Box 400
Philipsburg, MT 59858

Plains High School
412 Rittinour
Plains, MT 59859

Plentywood High School
100 E. Laurel Ave.
Plentywood, MT 59254

Small High Schools

Poplar High School
400 4th Ave West
Poplar, MT 59255

Rapelje High School
Box 104
Rapelje, MT 59067

Red Lodge High School
413 S. Oaks
Red Lodge, MT 59068

Richey High School
Box 16
Richey, MT 59259

Roberts High School
106 Maple
Roberts, MT 59070

Roundup High School
5 6th Ave
Roundup, MT 59072

Roy High School
Box 9
Roy, MT 59471

Blue Sky High School
Box 129
Rudyard, MT 59540

Ryegate High School
207 2nd Ave
Ryegate, MT 59074

Saco High School
Box 298
Saco, MT 59261

Savage High School
119 Mesa North
Savage, MT 59262

Shelby High School
NW of Shelby
Shelby, MT 59474

Shepherd High School
Box 8
Shepherd, MT 59079

Simms High School
4th Ave SE
Simms, MT 59477

St Ignatius High School
Box 400
St Ignatius, MT 59865

St Regis High School
Drawer K
St Regis, MT 59866

Superior High School
410 Arizona
Superior, MT 59872

Terry High School
215 East Park
Terry, MT 59349

Three Forks High School
210 East Neal
Three Forks, MT 59752

Vallier High School
Box 528
Vallier, MT 59487

Victor High School
Box 87
Victor, MT 59875

Whitewater High School
Box 46
Whitewater, MT 59544

Small High School

Wibaux High School
105 North F
Wibaux, MT 59353

Wilsall High School
Box 131
Wilsall, MT 59086

Winnett High School
Box 167
Winnett, MT 59087

Wolf Point High School
213 6th Ave S
Wolf Point, MT 59201

Huntley Project High School
213 6th Ave. South
Worden, MT 59088

Westby High School
Box 108
Westby, MT 59275

White Sulphur Springs High
Box 5
White Sulphur Springs, MT 59654

Whitehall High School
Whitehall, MT 59759

Junior High Schools

Castle Rock Jr. High School
1441 Governors Blvd.
Billings, MT 59102

Lewis & Clark Jr. High School
1315 Lewis Ave.
Billings, MT 59102

Lockwood Jr. High School
1932 Hwy 87 Rt. 2
Billings, MT 59102

Riverside Jr. High School
3700 Madison Ave.
Billings, MT 59102

Will James Jr. High School
1200 30th St.
Billings, MT 59102

Bozeman Jr. High School
309 N 11th Ave.
Bozeman, MT 59715

Browning Jr. High School
Box 610
Browning, MT 59417

East Jr. High School
2600 Grand Ave.
Butte, MT 59701

Columbia Falls Jr. High School
540 4th Ave. West
Columbia Falls, MT 59912

Conrad Jr. High School
215 S. Maryland
Conrad, MT 59425

Deer Lodge Jr. High School
Deer Lodge, MT 59722

Parkview Jr. High School
14 N. Cotton
Dillon, MT 59725

Radley School
226 E. Clinton
East Helena, MT 59635

Eureka Jr. High School
Box 2001
Eureka, MT 59917

Junior High Schools

Frenchtown Jr. High School
Box 117
Frenchtown, MT 59834

Washington School
N. Meade Ave.
Glendive, MT 59930

East & North Jr. High School
2601 8th St. NE
Great Falls, MT 59401

East Jr. High School
4040 Central Ave.
Great Falls, MT 59401

North Jr. High School
2601 8th St. NE.
Great Falls, MT 59404

Hardin 7-8
611 West 5th
Hardin, MT 59034

C.R. Anderson Middle School
1200 Knight
Helena, MT 59601

Helena Middle School
1025 Rodney
Helena, MT 59601

Cayuse Prairie School
897 Lake Blaine Rd.
Kalispell, MT 59901

Kalispell Jr. High School
Northridge Heights
Kalispell, MT 59901

Laurel Middle School
410 Colorado
Laurel, MT 59044

Lewistown Middle School
914 W. Main
Lewistown, MT 59457

Libby Jr. High School
Rt. 3 Skidale
Libby, MT 59923

Livingston 6-8
5th & Callendar
Livingston, MT 59047

Washington School
210 N. 9th
Miles City, MT 59301

Missoula Elementary Dist. 1
215 S. 6th West
Missoula, MT 59801

Polson Middle School
111 4th Ave.
Polson, MT 59860

Poplar 5-8
400 4th Ave. West
Poplar, MT 59255

Sidney 7-8
S. Central Ave.
Sidney, MT 59270

Wolf Point 7-8
213 6th Ave.
Wolf Point, MT 59201

Whitefish Central 7-8
2nd & Spokane
Whitefish, MT 59937