
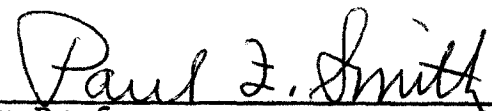


A STUDY OF THE PHYSICAL FACILITIES NEEDED FOR ORGANIZING,
ADMINISTRATING, AND IMPLEMENTING VOCATIONAL-INDUSTRIAL
EDUCATION IN THE MONAHANS-WICKETT-PYOTE
INDEPENDENT SCHOOL DISTRICT

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INDEPENDENT SCHOOL DISTRICT

THESIS

Presented to the Graduate Council of the
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For the Degree of

MASTER OF SCIENCE

By

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CHAPTER I

INTRODUCTION

The Monahans-Wickett-Pyote Independent School District has initiated plans to expand its vocational education program and to institute a program of industrial-vocational education. The vocational program presently offered by the school system consists of distributive education, home economics, and vocational office practices. The latter became a part of the curriculum in September, 1967.

George Cullender, Superintendent of Schools in the Monahans-Wickett-Pyote Independent School District, requested assistance from the Texas Education Agency in planning and conducting an occupational survey to determine current and projected employment needs in the area served by the Monahans-Wickett-Pyote School District. The survey was made, and a report of the survey was submitted to the administration in April, 1967. The occupational survey was premised "upon the philosophy that many students who enter high school do not complete the full academic course of study leading to graduation, and a large percentage of high school graduates do not enter college."¹ The students who leave school prior

¹Texas Education Agency, A Survey to Determine the Need for Vocational Education for the Monahans-Wickett-Pyote Independent School District (Austin, April, 1967), p. 1.

to graduation or who graduate but do not attend college should be given an opportunity to complete a training course which will prepare them for a trade or an occupation.

The philosophy of the Texas Education Agency concerning vocational education was further revealed in the statement that "upon completion of a high school program which includes vocational education, students are better equipped to accept the duties of responsible citizenship than their contemporaries who have not participated in an effective vocational education program."² The philosophy previously stated implies that a vocational program geared to the needs of the community should encourage the potential dropout to remain in school and give those students who cannot afford to enter college an opportunity for training which, in the development of basic occupational knowledge and skills, will prepare them for a better position in the community.

Purpose of the Study

The purpose of the study was to gather information that would be helpful in planning and implementing a vocational education program in the Monahans-Wickett-Pyote Independent School District in response to a written request by George L. Cullender, Superintendent of Schools.³ This study was

²Ibid.

³Letter from George L. Cullender, Superintendent of Schools, Monahans-Wickett-Pyote Independent School District, Monahans, Texas, June 15, 1967.

intended to supplement the Texas Education Agency's occupational survey by obtaining answers to the following questions:

1. In what specific courses in industrial-vocational education are the students of Monahans High School interested?
2. What course content and skills should be stressed and taught to meet community needs in the fields of metal trades, machine work, and automobile mechanics?
3. What equipment will be needed to provide instruction in maximum size classes in the previously mentioned vocational fields and what will be the approximate cost of the equipment?
4. What physical facilities will be needed to house the equipment and related instructional areas?
5. What will be the approximate cost of the physical facilities?

Background and Significance of the Study

The Monahans-Wickett-Pyote Independent School District is located in the northeastern section of Ward County, Texas. The school district serves an estimated 827-square-mile area and encompasses the cities of Monahans, Wickett, and Pyote. The district's main industries are oil production and manufacturing of oil by-products.

Total enrollment in the Monahans-Wickett-Pyote Independent School District in grades nine through twelve for the school year 1966-1967 was 827, which represents a 23.98 per cent increase in the past five years. The projected enrollment for the next five years is 1,015,⁴ which is an increase of 22.73 per cent. These increases indicate a steady growth of the community.

During the 1966-1967 school year 88 per cent of the students were enrolled in nonvocational classes, 8.2 per cent in vocational home economics, and 3.8 per cent in distributive education.⁵ The school system also offered instruction in vocational office practices during the school year of 1967-1968. Only 2.8 per cent of the students were enrolled in this class. A further analysis of the school records showed that an average of 32 per cent of the graduating students between the school years 1961 and 1967 did not enter college and that 36.1 per cent of the students entering the ninth grade in 1963 did not finish the high school program required for graduation. With only 14.8 per cent of the students enrolled in vocational education courses in 1967-1968, the remaining students who do not enter college have very little, if any, opportunity for job training. Benham stated:

⁴Texas Education Agency, op. cit., p. 4.

⁵Ibid., p. 5.

. . . secondary schools have been evaluated far too long on the basis of myths and personal prejudices. In some communities, dramatics, music, athletic teams, and the percent of students entering college become important issues in judging the quality of secondary education. These are important, but to a relatively small percent of the student body and to a proportionately small number of taxpayers who support the school.⁶

The lack of suitable vocational education may be responsible for much of the dropout problem, and, according to Levitan, "inadequate vocational preparation contributes to youth unemployment, and skill shortages in our economy have stimulated public concern about the scope and nature of current vocational education programs."⁷ Numerous researchers, governmental agencies, and lawmakers have found evidence that vocational training for youth and adults will attribute to a decrease in unemployment, crime, poverty, and inflation. This evidence helped prompt passage of the Vocational Education Act of 1963. Feirer made the following observation concerning vocational training.

It is certainly evident that, to date, there has not been the necessary commitment to vocational education in this country. All too frequently, public attitude has reflected a belief that occupational skills are so elementary and simple that they can be picked up by the worker as he needs them on his job.

Nothing could be farther from fact. Not many people would allow an automobile or television set to be serviced or repaired by a do-it-yourselfer.

⁶Lloyd G. Benham, "Vocational Challenge--A Comprehensive High School's Program," School Shop, XXVI (June, 1967), 27.

⁷Sar A. Levitan, Public Policy Information Bulletin (Kalamazoo, Michigan, May, 1963), p. 1.

What is badly needed is a tremendous increase in the numbers of skilled workers who are both efficient and speedy in the skills needed to do their jobs. Efficiency and speed can be obtained only by graduates of qualified vocational education programs.⁸

In view of the apparent need for vocational education programs, the Monahans-Wickett-Pyote Independent School District, in conjunction with the Texas Education Agency, conducted an occupational survey to determine the present and projected employment needs of the community. The results of this survey were to be utilized to determine the needs for vocational education in the community.

To secure the data for the study, a survey-inquiry questionnaire was used. This questionnaire was administered to employers picked at random from the community's industries. Forming the basis of the study, the data in Tables I and II present information concerning industrial occupational needs and the summary of the immediate and projected needs in major occupational categories, respectively.

Each employer contacted during the survey was asked to identify programs of training which would be of benefit to his present employees and which would contribute to the success of his business. The occupations in which additional training is needed were found to be automobile mechanics,

⁸John L. Fierer, "Inflation and Vocational Education," Industrial Arts and Vocational Education, LVI (April, 1967), 27.

TABLE I
DATA CONCERNING PRESENT AND FUTURE INDUSTRIAL OCCUPATIONS*

Occupational Category	Total Employed April 1967		Projected Employee Needs			
	Male	Female	Immediate	12 Mos.	24 Mos.	36 Mos.
A/C & Refrig. Maintenance & Repairman	1	0	1	1	0	0
Appliance Repairman	4	0	0	0	0	0
Automobile Body and Trim Worker	10	0	0	1	1	1
Automobile Mechanic	39	0	4	10	6	5
Beauty Operator	0	31	3	6	2	3
Carpenter-Woodworker	3	0	0	1	0	1
Cleaner-Presser	6	15	1	6	2	3
Cook	6	16	2	2	3	3
Custodian	49	0	4	7	4	2
Electrical Worker	41	0	3	3	2	5
Heavy Equipment Operator	122	0	6	6	6	8
Machine Operator, Other than Machinist	56	1	5	6	5	5
Machinist	9	0	0	1	1	1
Maintenance Mechanic, General	36	0	1	5	1	2
Masonry Worker	12	0	0	1	1	1
Meat Cutter	7	2	1	3	2	0
Metal Worker-Welder	3	0	1	1	1	1
Painter	2	0	1	1	0	0
Plumber-Steam Fitter	20	0	0	5	4	6
Printer and Printing Machine Operator	8	1	1	0	0	0
Radio & Television Repairman	6	0	0	2	0	0
Upholsterer	2	0	0	0	0	0
Well Service Operator	234	0	2	12	17	21
Other Industrial Occupations	97	0	0	10	0	0
Total	773	66	36	90	58	68

*Texas Education Agency, op. cit., p. 15.

beauty training, electrical trades, general office practices, safety, and salesmanship.⁹

TABLE II

SUMMARY OF IMMEDIATE AND PROJECTED NEED FOR NEW EMPLOYEES
IN MAJOR OCCUPATIONAL CATEGORIES, MONAHANS-WICKETT-
PYOTE INDEPENDENT SCHOOL DISTRICT, 1967-1970*

Occupational Category	Imme- diate	12 Mos.	24 Mos.	36 Mos.	Total
Distributive Occupations	11	58	36	31	136
Health Occupations	4	7	6	3	20
Home Economics Occupations	7	11	12	12	42
Industrial Occupations	36	90	58	68	252
Office Occupations	10	22	26	15	73
Technical Occupations	0	0	0	0	0
Public Service Occupations	3	3	3	3	12
Total	71	191	141	132	535

*Texas Education Agency, op. cit., p. 27.

According to the survey by the Texas Education Agency, there were fifty-six machine operators other than machinists employed in April, 1967. However, in the Monahans-Wickett-Pyote Independent School District there are only two machine shops. The total employment in these two firms is eight people. This discrepancy could possibly be accounted for by the terminology used by the survey team.

Ludwig defined a machine operator as a person who "does only one operation on a machine over and over all day long.

⁹Texas Education Agency, op. cit., p. 24.

He is taught in a few minutes how to start and stop the machine, clamp the work in place, and take it out of the machine when the operation is done."¹⁰ In contrast, Feirer and Tatro stated a machine operator is "one who specializes in operating one type of machine. He may not be required to serve an apprenticeship, rarely plans his own work methods and in some shops may not be required to set up his own machine."¹¹

For the purposes of the study, it was assumed that "machine operators" referred to in Table I were applicable to machine operators in fields other than metalworking. The interviews, which were conducted as a part of the survey by the Texas Education Agency, did show a need for more machine shops in the Monahans-Wickett-Pyote Independent School District area, since much of the machine work was sent to a more industrialized city near the school district. This finding indicated a need for further study and gave impetus to this study.

The survey also revealed that there were three welders employed during April, 1967. However, a year later there were eleven welders employed by five different firms. Most of these firms were in need of additional welders at that

¹⁰Oswald A. Ludwig, Metalwork--Technology and Practice (Bloomington, Illinois, 1947), p. 16.

¹¹John L. Feirer and Earl E. Tatro, Machine Tool Metalworking (New York, 1961), p. 426.

time. Individuals who own portable welding machines and work for themselves were not included in the survey.

It is possible that the development of a large natural gas field in the Pyote area will create an additional demand for more welders in the area. The survey made by the Texas Education Agency did not include this development.

Limitations of the Study

The study was limited to obtaining additional information needed to establish present needs for the development of vocational training courses in automobile mechanics, general machine work, and metal trades in the Monahans-Wickett-Pyote Independent School District.

The study was further limited to securing information concerning course content, equipment, and facilities needed to implement and administer the vocational training courses and an estimated cost of equipment and facilities needed for conducting the program.

Definition of Terms

For clarification purposes certain terms used in the study were defined as follows:

Vocational-industrial education, which is sometimes called trades and industry, is

. . . preparation for entrance into and up-grading in a skilled industrial trade or occupation. It is a program planned to improve efficiency in a specific

occupation either in preparation for employment or to improve abilities on the job. . . . A student, through proper guidance, can choose instruction in some particular occupational area in which there is interest and which provides a reasonable assurance of earning a living. These might be such traditional programs as machine shop, carpentry, or auto mechanics; or more recent programs for the training of such craftsmen as maintenance electrician and appliance repairman.¹²

Industrial arts is a study of tools, materials, processes, products, and occupations of the industrial society, and includes a wide variety of experiences in drawing and design, metalworking, electricity-electronics, power mechanics, woodworking, graphic arts, and industrial crafts. A good industrial arts program affords students an insight into American industry, the sources of raw materials and how they are processed, how products are designed and produced, and how people earn a living. It provides an opportunity for students to discover their aptitudes and abilities in the various fields of technology.¹³

Vocational distributive education is a program of cooperative part-time training designed to provide technical instruction and on-the-job supervised training and work experiences for high school students preparing to enter employment in occupational classifications such as marketing

¹²John L. Feirer, "Administering Industrial Education," Industrial Arts and Vocational Education, L (May, 1961), 48.

¹³Ibid.

and distributing products and services in retailing and wholesaling establishments.¹⁴

Vocational office education is a program of cooperative part-time training designed to provide technical instruction and on-the-job supervised training and work experience for high school students preparing to enter employment in office occupations.¹⁵

Method of Securing Data

The background informational data for this study were taken from an occupational survey conducted by the Texas Education Agency in conjunction with the Monahans-Wickett-Pyote Independent School District.

Data concerning students' future plans and interests in vocational-industrial education were gathered by a study of the school's permanent records and a questionnaire completed by 676 students. The questionnaires were administered by the English Department, since English is the only class which all students are required to attend each day. Each questionnaire contained spaces for the name and address of each student.

¹⁴Texas Education Agency, Guide for Public Schools in Planning Programs of Vocational Education for In-School Students (Austin, September, 1966), p. 59.

¹⁵Ibid., p. 79.

Information pertaining to what phases of course content should be stressed and what type of tools and equipment are used by industry located in the school district was gathered by interviews and a checklist completed by a representative of each established metalworking and automobile mechanics firm in the school district.

Other information was obtained from published materials and unpublished related materials, such as theses and mimeographed materials.

Related Studies

McNeese's study to determine whether a need existed for additional programs in vocational and industrial arts education at Lawrence D. Bell High School in the Hurst-Euless-Bedford Independent School District was based on information secured from industry and 326 checklists. The information gathered through the use of checklists was obtained from persons who had graduated from the school between the years of 1960 and 1964. McNeese found that 80 per cent of the respondents were employed or students and that 67 per cent had attended a college or university. The respondents indicated that vocational guidance was inadequate and that English was the most important course taught in the school. Foreign language was the least important, according to the former students. One of the recommendations made by McNeese

was that vocational-industrial education be expanded to include two full units.¹⁶

A study made by Dennis to determine the need for and interest in a vocational-industrial education program in the Eagle Mountain-Saginaw School District indicated that industry located in the school district would supply ample employment for the graduates of a vocational-industrial education program in several fields. The students attending the junior high and high school showed a definite interest in vocational education, and approximately one half of them planned to attend college. The study revealed the adults in the community also had an interest in vocational education. Dennis recommended that Boswell High School initiate a vocational education program, place more emphasis on vocational guidance, and encourage vocational courses be chosen from those courses in which the students showed an interest.¹⁷

In a study by Campbell to develop standards for use in planning or renovating industrial arts laboratories in public schools, an analysis of both the activities and an

¹⁶Charles H. McNeese, "A Study to Determine the Need for Additional Programs in Vocational and Industrial Arts Education at Lawrence D. Bell High School," unpublished master's thesis, Department of Industrial Arts, North Texas State University, Denton, Texas, 1968.

¹⁷Thomas E. Dennis, Jr., "A Study to Determine the Need for an Interest in a Vocational Industrial Education Program in the Eagle Mountain-Saginaw School District," unpublished master's thesis, Department of Industrial Arts, North Texas State University, Denton, Texas, 1967.

approved curricula for industrial arts courses offered in Texas schools was made to determine the facilities needed in an industrial arts program. The study presented a set of standards concerned with space requirements for industrial arts laboratories inclusive of floor space, storage and special areas, doors and corridors, ceiling heights, lighting, climatic controls, acoustics, exhaust and electrical systems, and shape and locations of the laboratories. The data were obtained by a study of eleven state plans for use in planning and equipping industrial arts facilities and through other professional literature.¹⁸

Three suggested basic course outlines prepared in a special workshop conducted cooperatively by the Texas Education Agency and the Engineering Extension Service of Texas A and M University contained information to assist the beginning trade preparatory teacher in planning his laboratory and related instructional areas and provided a basis upon which he could build his own course of study to meet the needs of the community. Each course outline also provided school administrators and boards of education with information that could assist them in selecting and inaugurating trade preparatory programs suited to the needs

¹⁸Bernice S. Campbell, "A Study to Develop Standards for Use in Planning or Renovating Industrial Arts Laboratories in Public Schools," unpublished master's thesis, Department of Industrial Arts, North Texas State University, Denton, Texas, 1968.

of their student bodies. Each of the three outlines, one in automobile mechanics,¹⁹ one in machine shop,²⁰ and one in metal trades,²¹ presented basic facility floor plans and tool and equipment lists, including prices.

Organization of the Study

The study is organized into six chapters. Chapter I contains an introduction to the study, the purpose of the study, the definition of terms, the methods of securing the data, related studies, and the organization of the study.

Chapter II presents data concerning students' future plans and interests in vocational education. An analysis of the data presented indicates which vocational courses are of interest to the students and whether there exists a need for more occupational guidance.

Chapter III is concerned with data relevant to the phases of instruction which local employers in the fields of automobile mechanics, general machine work, and metal trades indicated that would be important to a student seeking employment in their firms.

¹⁹C. M. Allen and others, Suggested Basic Course Outline for Automobile Mechanics (College Station, Texas, 1964).

²⁰C. M. Allen and others, Suggested Basic Course Outline for Machine Shop (College Station, Texas, 1964).

²¹C. M. Allen and others, Suggested Basic Course Outline for Metal Trades (College Station, Texas, 1964).

Chapter IV presents information obtained on equipment recommended for use in pre-employment vocational programs for skilled occupations in the courses of automobile mechanics, metal trades, and general machine work. An estimated cost of the recommended equipment is also presented in this chapter.

Chapter V presents the recommended space requirements and estimated cost of needed facilities for instruction in automobile mechanics, metal trades, and general machine work.

Chapter VI contains a summary of the study, the findings of the study, and the recommendations. The Appendix contains a sample questionnaire and the checklist used to gather information from industrial representatives.

CHAPTER II

DATA CONCERNING STUDENTS' FUTURE PLANS AND INTEREST IN VOCATIONAL-INDUSTRIAL EDUCATION

The data presented in Chapter II were gathered through a study of the school's permanent records and a questionnaire completed by 676 students enrolled in Monahans High School. The questionnaire was completed by 116 twelfth-grade boys and girls, 145 eleventh-grade boys and girls, 198 tenth-grade boys and girls, and 217 ninth-grade boys and girls. The questionnaire was of the forced-answer type and required an answer of "yes" or "no" to each item.

Data presented in Tables III, IV, V, and VI concern the students' future plans. The tables represent the ninth, tenth, eleventh, and twelfth grades separately, and are divided into two classifications--boys and girls.

Of the 116 twelfth-grade students answering the questionnaires, 4 boys (5.5 per cent) and 7 girls (16.3 per cent), or a total of 11 students, who represented 9.5 per cent of the twelfth-grade students, planned to attend a trade school after graduation. The data representing the eleventh grade, as shown in Table IV, indicate that 12 boys (16.4 per cent) and 32 girls (44.4 per cent), or a total of 44 students, who represented 30.3 per cent of the 145

TABLE III
 DATA CONCERNING RESPONSES OF TWELFTH-GRADE STUDENTS
 TO QUESTIONS CONCERNING FUTURE PLANS

Question	Responses (N = 116)							
	Boys (N = 73)				Girls (N = 43)			
	Yes	%	No	%	Yes	%	No	%
Do you plan to graduate from high school?	73	100.0%	0	0.0%	43	100.0%	0	0.0%
Do you plan to attend college?	64	87.7	9	12.3	33	77.2	10	22.8
Do you plan to attend a trade school after graduation?	4	5.5	69	94.5	7	16.3	36	83.7
Do you plan to quit school before graduation and attend a trade school?	0	0.0	73	100.0	0	0.0	43	100.0
Do you plan to quit school and go to work?	0	0.0	73	100.0	0	0.0	43	100.0

TABLE IV
 DATA CONCERNING RESPONSES OF ELEVENTH-GRADE STUDENTS
 TO QUESTIONS CONCERNING FUTURE PLANS

Question	Responses (N = 145)							
	Boys (N = 73)				Girls (N = 72)			
	Yes	%	No	%	Yes	%	No	%
Do you plan to graduate from high school?	72	98.6%	1	1.4%	71	98.6%	1	1.4%
Do you plan to attend college?	54	74.0	19	26.0	39	54.2	33	45.8
Do you plan to attend a trade school after graduation?	12	16.4	61	83.6	32	44.4	40	55.6
Do you plan to quit school before graduation and attend a trade school?	1	1.4	72	98.6	1	1.4	71	98.6
Do you plan to quit school and go to work?	1	1.4	72	98.6	1	1.4	71	98.6

TABLE V

DATA CONCERNING RESPONSES OF TENTH-GRADE STUDENTS
TO QUESTIONS CONCERNING FUTURE PLANS

Question	Responses (N = 198)							
	Boys (N = 107)				Girls (N = 91)			
	Yes	%	No	%	Yes	%	No	%
Do you plan to graduate from high school?	107	100.0%	0	0.0%	91	100.0%	0	0.0%
Do you plan to attend college?	96	89.9	11	10.2	53	57.1	38	42.9
Do you plan to attend a trade school after graduation?	20	18.7	87	81.3	26	28.7	65	71.3
Do you plan to quit school before graduation and attend a trade school?	0	0.0	107	100.0	0	0.0	91	100.0
Do you plan to quit school and go to work?	0	0.0	107	100.0	0	0.0	91	100.0

TABLE VI
DATA CONCERNING RESPONSES OF NINTH-GRADE STUDENTS
TO QUESTIONS CONCERNING FUTURE PLANS

Question	Responses (N = 217)							
	Boys (N = 106)				Girls (N = 111)			
	Yes	%	No	%	Yes	%	No	%
Do you plan to graduate from high school?	105	99.1%	1	0.9%	109	98.2%	2	0.8%
Do you plan to attend college?	86	81.1	20	18.9	77	69.4	34	30.6
Do you plan to attend a trade school after graduation?	20	18.9	86	81.1	20	18.0	91	82.0
Do you plan to quit school before graduation and attend a trade school?	0	0.0	106	100.0	0	0.0	111	100.0
Do you plan to quit school and go to work?	1	0.9	105	99.1	2	0.8	109	98.2

eleventh-grade students, planned to attend a trade school after completing high school. The data in Table V indicate that 20 boys (18.7 per cent) and 26 girls (28.7 per cent) enrolled in the tenth grade had plans to attend a trade school upon completion of high school. Of the 198 tenth-grade students answering the questionnaire, a total of 46 (23.3 per cent) represented those who indicated a preference for attending a trade school. The ninth grade was the largest and also the youngest age group who answered the questionnaire. Twenty boys (18.9 per cent) and 20 girls (18 per cent), a total of 40 students (18.4 per cent), planned to attend a trade school.

The total scholastic enrollment of Monahans High School during the 1967-1968 school year was 837 students. The questionnaire was answered by 676 students, representing 80.7 per cent of the total student body. Of these 676 students, 141 (20.9 per cent) planned to attend some type of trade school.

Concerning the question of whether the students planned to graduate from high school, only 6 of the 676 students indicated they did not plan to finish high school. Of the 359 boys enrolled in the ninth, tenth, eleventh, and twelfth grades, there were 300 (83.6 per cent) who planned to attend college. Of the 317 girls enrolled in the ninth, tenth, eleventh, and twelfth grades, 202 (63.1 per cent) planned to

attend college. A total of 174 boys and girls who answered the questionnaire did not plan to attend college. As mentioned previously, there were 141 students who planned to attend a trade school, leaving 33 students (4.9 per cent) who did not plan to extend their education beyond high school.

Only one boy and one girl enrolled in the eleventh grade indicated they planned to quit high school to attend a trade school. Five students indicated they planned to quit high school and go to work. These five students were one tenth-grade boy, one eleventh-grade boy, two ninth-grade girls, and one eleventh-grade girl.

Data in Tables VII, VIII, IX, and X pertain to the students' occupational choices and plans for the future, and show a separation of students who planned to attend college from those who planned to terminate their formal schooling with high school.

The Texas Education Agency states that one important consideration relating to decision making in determining the program to be initiated is the following:

. . . the exclusion of any program designed to prepare individuals for occupations generally considered to be professional or as requiring the baccalaureate or higher degree. Therefore, any program designed to be pre-college work for a program in college to prepare individuals for an occupation requiring a baccalaureate or higher degree cannot be construed as being eligible as a program of vocational education in public schools.¹

¹Texas Education Agency, Guide for Public Schools in Planning Programs of Vocational Education for In-School Students (Austin, September, 1966), p. 3.

Data in Table VII indicate that eleven students in the twelfth grade, three boys and eight girls, who did not plan

TABLE VII
DATA CONCERNING THE FUTURE OCCUPATIONS AND
PLANS OF TWELFTH-GRADE STUDENTS

Planned Profession	Number Planning to Attend College		Number Planning Not to Attend College	
	Boys	Girls	Boys	Girls
Undecided	8	3	6	2
Teaching	11	17	0	0
Law	8	0	0	0
Engineering	7	0	0	0
Medicine	6	4	0	0
Business	6	0	0	0
Computer science	5	0	0	0
Accounting	3	0	0	0
Banking	3	0	0	0
Agriculture	1	0	0	0
Television studio work	1	0	0	0
Journalism	1	0	0	0
Missionary work	1	0	0	0
Mechanics	1	0	1	0
Social work	1	0	0	0
Industrial electronics	1	0	0	0
Drafting	0	0	1	0
Oil field work	0	0	1	0
Nursing	0	1	0	0
Music	0	1	0	0
Secretarial	0	6	0	3
Beautician	0	0	0	2
Physicist	0	1	0	0
Housewife	0	0	0	3
Total	64	33	9	10

to attend college were planning vocations in which a vocational-industrial education course could have prepared

them. Six students who had not planned to attend college had not made a definite decision concerning their future vocation. Eight boys and three girls who were planning to attend college were undecided about their future vocation. Responses made by those students who planned to attend college indicate that teaching was the most frequently chosen area of preparation. Other areas frequently chosen were law, engineering, medicine, business, and computer science.

In Table VIII the data reveal that of the 145 eleventh-grade students answering the questionnaire, there were 14 boys and 6 girls who planned to attend college. There were 8 boys and 5 girls who had not planned to attend college and were undecided about their future occupations. Teaching, selected 17 times, was the most frequently chosen profession by the girls who planned to attend college, while only 4 boys were planning to teach. Secretarial work was selected by 13 of the girls who did not plan to attend college. Seven girls planned to be beauticians.

Table IX presents data that show that 2 boys and 10 girls enrolled in the tenth grade did not plan to attend college and were also undecided about future occupational plans. Of the girls who did not plan to attend college, 10 selected secretarial work, 6 selected beauty culture, and 5 planned to be housewives. Of the boys who did not plan to attend college, 3 selected agriculture as their future

TABLE VIII
 DATA CONCERNING THE FUTURE OCCUPATIONS AND
 PLANS OF ELEVENTH-GRADE STUDENTS

Planned Profession	Number Planning to Attend College		Number Planning Not to Attend College	
	Boys	Girls	Boys	Girls
Undecided	14	6	8	5
Engineering	7	0	0	0
Medicine	6	0	0	0
Computer science	4	1	0	0
Law	5	0	0	0
Teaching	4	17	0	0
Ministry	2	0	0	0
Pharmacy	2	0	0	0
Agriculture	2	0	0	0
Business	1	0	0	0
Aviation	1	0	0	0
Biologist	1	0	0	0
Industrial foreman	1	0	0	0
Mechanics	1	0	3	0
Printer	1	0	0	0
Banking	1	0	0	0
Social work	1	1	0	0
Machinist	0	0	1	0
Electronics	0	0	2	0
Welder	0	0	1	0
Oil field work	0	0	1	0
Interior decorator	0	3	0	0
Model	0	0	0	1
Army	0	0	2	0
Airline hostess	0	0	0	3
Barber	0	0	1	0
Art	0	1	0	1
Secretarial	0	5	0	13
Housewife	0	1	0	3
Nursing	0	2	0	0
Beautician	0	2	0	7
Total	54	39	19	33

vocation. All other areas of study listed in Table IX were chosen only one time.

TABLE IX
DATA CONCERNING THE FUTURE OCCUPATIONS AND
PLANS OF TENTH-GRADE STUDENTS

Planned Profession	Number Planning to Attend College		Number Planning Not to Attend College	
	Boys	Girls	Boys	Girls
Undecided	33	11	2	10
Engineering	11	0	0	0
Teaching	14	14	0	0
Agriculture	7	0	3	0
Medicine	5	5	0	0
Business	5	1	0	0
Law	4	1	0	0
Computer science	2	2	0	0
Chemist	3	0	0	0
Secretarial	0	10	0	10
Dancing teacher	0	0	0	1
Nursing	0	1	0	1
Beautician	0	0	0	6
Housewife	0	4	0	5
Airline hostess	0	1	0	3
Commercial art	0	2	1	0
Interior decorator	0	1	0	0
Welding	2	0	0	0
Drafting	0	0	1	0
Government hunter	1	0	0	0
Veterinarian	3	0	0	0
Oceanographer	1	0	0	0
Game warden	4	0	0	0
Mechanics	2	0	1	0
Airport towerman	1	0	0	0
Electronics	0	0	1	0
Butcher	0	0	1	0
Construction	0	0	1	0
Total	98	53	11	36

The data in Table X indicate that among the boys who did not plan to attend college there were 5 who planned to

TABLE X
DATA CONCERNING THE FUTURE OCCUPATIONS AND
PLANS OF NINTH-GRADE STUDENTS

Planned Profession	Number Planning to Attend College		Number Planning Not to Attend College	
	Boys	Girls	Boys	Girls
Undecided	23	24	13	11
Engineering	16	1	0	0
Teaching	14	19	0	0
Medicine	7	1	0	0
Mechanics	5	0	5	0
Electronics	3	0	0	0
Architecture	3	0	0	0
Law	3	1	0	0
Commercial art	2	2	0	0
Agriculture	2	0	0	0
Nursing	0	5	0	1
Secretarial	0	12	0	12
Airline hostess	0	4	0	1
Missionary	0	3	0	0
Beautician	1	1	0	6
Modeling	0	0	0	1
Veterinarian	0	2	0	0
Housewife	0	0	0	1
Social worker	0	1	0	0
Interior decorator	0	1	0	0
Writer	0	0	0	1
Chemist	1	0	0	0
Oceanographer	1	0	0	0
Welding	1	0	2	0
Computer science	1	0	0	0
Dry cleaning	1	0	0	0
Business	1	0	0	0
Banking	1	0	0	0
Total	86	77	20	34

become automobile mechanics and 2 who planned to become welders. Thirteen of the boys and 11 of the girls who did not plan to attend college were undecided on a vocation. Twelve girls indicated they planned to work in the secretarial field. The only other area of study which was selected more than one time by the girls who did not plan to attend college was beauty culture, selected six times.

All students answering the questionnaire were asked to check their preferences from the list of vocational-industrial education courses, suggested by the Texas Education Agency,² which they would be interested in taking to prepare for a vocation. Tabulation of these data shows that 219 (32.4 per cent) of the 676 students did not indicate any preferences. Most of the students not responding to the course selection list indicated that they were not interested in any of the courses listed.

Data shown in Table XI indicate which vocational-industrial education courses the students, as a group, were interested in studying. Of the 270 boys answering the course selection list, 148 indicated they were interested in automobile mechanics and 115 in industrial electronics. Fourteen of the twenty vocational-industrial education courses were selected fewer than sixty-three times by these

²Texas Education Agency, Trade Preparatory Classes in High Schools, No. IE-1163-500 (Austin, [n.d.]).

same boys. As a group, the girls indicated more interest in cosmetology, with 155 of the 187 girls selecting this course. Commercial art was selected by 85 girls, and commercial cooking was selected by 84 girls.

TABLE XI
DATA CONCERNING FREQUENCY OF COURSE SELECTION
BY 457 HIGH-SCHOOL BOYS AND GIRLS

Vocational Courses	Boys	Girls	Total
Appliance Repair	22	3	25
Aircraft Mechanics	106	5	111
Automobile Mechanics	148	9	157
Building Construction Trades	105	5	110
Commercial Art	42	85	127
Commercial Cooking	11	84	95
Commercial Photography	49	56	105
Cosmetology	4	155	159
Drafting Trades	63	6	69
Needle Trades	3	36	39
Dry Cleaning and Finishing	8	23	31
Electrical Trades	98	2	100
Industrial Electronics	115	4	119
Leather Trades	39	8	47
Metal Trades	91	2	93
Mill Cabinetmaking	20	1	21
Piping Trades	20	0	20
Printing	39	46	85
Radio and Television Servicing	58	4	59
Refrigeration and Air Conditioning	34	2	36

Data in Tables XII, XIII, XIV, and XV indicate the students' preferences for the vocational-industrial education courses previously mentioned. The students were asked to select five courses which they would be interested in taking

and to indicate their first, second, third, fourth, and fifth choices.

TABLE XII
DATA CONCERNING INTEREST IN VOCATIONAL-INDUSTRIAL
EDUCATION COURSES BY 80 TWELFTH-GRADE STUDENTS

Courses	Frequency of Interest in 1, 2, 3, 4, and 5 Order											
	Boys						Girls					
	1	2	3	4	5	T*	1	2	3	4	5	T
Appliance Repair	0	0	1	3	3	7	0	0	0	0	0	0
Aircraft Mechanics	5	5	2	5	3	20	0	0	0	1	0	1
Automobile Mechanics	2	4	7	3	7	23	0	0	0	0	0	0
Building Construction Trades	2	6	1	5	5	19	0	0	1	0	0	1
Commercial Art	5	4	2	1	0	12	5	7	1	0	2	15
Commercial Cooking	2	1	1	1	0	5	1	3	4	2	2	12
Commercial Photography	7	0	3	1	4	15	1	9	3	2	0	15
Cosmetology	0	0	0	0	1	1	15	1	0	2	0	18
Drafting Trades	6	10	4	6	2	28	0	0	1	1	2	4
Needle Trades	0	0	0	0	0	0	1	2	1	0	1	5
Dry Cleaning and Finishing	1	0	0	0	1	2	0	0	1	0	1	2
Electrical Trades	5	7	10	5	2	29	0	0	0	0	0	0
Industrial Electronics	11	6	7	2	2	28	0	0	0	0	0	0
Leather Trades	0	0	2	3	2	7	0	0	1	0	0	1
Metal Trades	5	1	3	2	5	16	0	0	0	0	0	0
Mill Cabinetmaking	0	0	0	1	0	1	0	0	0	0	0	0
Piping Trades	0	1	0	1	1	3	0	0	0	0	0	0
Printing	1	2	3	2	3	11	1	1	4	3	1	10
Radio and Television Servicing	3	4	5	7	2	21	0	0	0	1	0	1
Refrigeration and Air Conditioning	1	1	1	2	3	8	0	0	0	1	0	1

*Total.

Data in Table XII show the choices of 56 (76.7 per cent) of the 73 twelfth-grade boys and 24 (55.8 per cent) of

the 43 twelfth-grade girls answering the questionnaire. Not all of the students answering the questionnaire indicated five preferences. The data show that 29 boys indicated an interest in the electrical trades, but only 5 of the boys selected electrical trades as their first choice. Both drafting trades and industrial electronics were chosen a total of 28 times; industrial electronics was the first choice of 11 students; drafting trades was the first choice of 6 students; and automobile mechanics was chosen 23 times, but was the first choice of only 2 students. Commercial photography was the first choice of 7 students; however, 8 other students indicated an interest in it.

The courses chosen most frequently by the girls were cosmetology, commercial art, commercial photography, and commercial cooking. Cosmetology was checked as the first interest of 15 of the girls. Fifty-six (100 per cent) of the twelfth-grade boys and 18 (75 per cent) of the girls indicated that they would take the courses if they were available.

Table XIII presents data that indicate the choices of eleventh-grade students. Of the 73 eleventh-grade boys, 54 (74 per cent) indicated the courses they preferred. Forty-two (58.3 per cent) of the 72 eleventh-grade girls also indicated their preference of courses. Automobile mechanics was checked 26 times, and 13 of these were first choices.

Courses in industrial electronics and aircraft mechanics were selected 24 times each; both courses were the first choice of 8 students. Metal trades was selected 23 times with 8 first choices. Cosmetology was selected 41 times by

TABLE XIII
DATA CONCERNING INTEREST IN VOCATIONAL-INDUSTRIAL
EDUCATION COURSES BY 96 ELEVENTH-
GRADE STUDENTS

Courses	Frequency of Interest in 1, 2, 3, 4, and 5 Order											
	Boys						Girls					
	1	2	3	4	5	T*	1	2	3	4	5	T
Appliance Repair	1	0	2	0	0	3	0	0	0	1	1	2
Aircraft Mechanics	8	9	0	6	1	24	0	1	0	1	1	3
Automobile Mechanics	13	2	7	2	2	26	0	1	1	0	0	2
Building Construction Trades	1	6	3	6	2	18	0	0	0	0	0	0
Commercial Art	3	0	0	0	0	3	4	5	5	2	1	17
Commercial Cooking	0	0	0	0	1	1	6	10	2	1	0	19
Commercial Photography	1	4	1	1	2	9	1	4	4	3	1	13
Cosmetology	1	1	0	0	0	2	30	5	5	1	0	41
Drafting Trades	1	6	0	1	0	8	0	1	0	1	0	2
Needle Trades	0	0	0	1	0	1	0	3	4	3	0	10
Dry Cleaning and Finishing	0	0	1	0	1	2	0	2	4	2	1	9
Electrical Trades	3	8	2	4	2	19	0	0	0	1	0	1
Industrial Electronics	8	4	9	1	2	24	0	0	0	0	0	0
Leather Trades	0	2	1	0	0	3	0	0	0	1	2	3
Metal Trades	8	3	5	4	3	23	0	0	0	0	0	0
Mill Cabinetmaking	0	0	0	1	0	1	0	0	0	0	0	0
Piping Trades	0	0	1	0	1	2	0	0	0	0	0	0
Printing	3	1	4	1	1	10	1	1	0	1	5	8
Radio and Television Servicing	2	0	1	3	4	10	0	0	0	0	0	0
Refrigeration and Air Conditioning	1	0	1	2	3	7	0	0	0	0	0	0

*Total.

the 42 girls and was the first choice of 30 girls. Commercial cooking was selected 19 times. Of the 42 girls answering the questionnaire, 38 (90.4 per cent) indicated they would like to take one or more of the courses if they were offered. Fifty-four boys completed the checklist, and 51 (94.4 per cent) of them indicated they would like to take the various courses listed on the checklist.

Data in Table XIV show the interest of 72 (67.3 per cent) of the 107 tenth-grade boys and 57 (62.6 per cent) of the 91 tenth-grade girls answering the questionnaire. The tenth-grade boys selected automobile mechanics 38 times; 13 of these were first choices. Industrial electronics was selected 28 times and was the first choice of 9 students. Courses in building construction trades and aircraft mechanics were chosen 26 times each. Aircraft mechanics was the first choice of ten students. Building construction was the first choice of 7 students.

The tenth-grade girls checked cosmetology 47 times with 25 of these selections being first. There were only 10 (17.5 per cent) of the girls answering the questionnaire who did not indicate an interest in cosmetology. Commercial art was selected 33 times and was the first choice of 14 girls. Commercial cooking was chosen 33 times and was the first choice of 8 girls. When asked whether they would take any course listed in the checklist if they were available, 47

(82.5 per cent) of the tenth-grade girls and 58 (80.6 per cent) of the tenth-grade boys indicated they would like to take the courses.

TABLE XIV

DATA CONCERNING INTEREST IN VOCATIONAL-INDUSTRIAL
EDUCATION COURSES BY 129 TENTH-GRADE STUDENTS

Courses	Frequency of Interest in 1, 2, 3, 4, and 5 Order											
	Boys						Girls					
	1	2	3	4	5	T*	1	2	3	4	5	T
Appliance Repair	0	0	2	1	0	3	1	0	1	2	0	4
Aircraft Mechanics	10	7	6	2	1	26	0	0	0	0	0	0
Automobile Mechanics	13	12	8	4	1	38	2	1	1	0	0	4
Building Construction Trades	7	5	5	3	6	36	0	0	0	1	0	1
Commercial Art	3	4	0	2	1	10	14	8	6	4	1	33
Commercial Cooking	2	0	0	0	1	3	8	14	8	1	2	33
Commercial Photography	3	4	3	3	1	14	5	8	4	3	0	20
Cosmetology	0	0	0	0	0	0	25	10	7	3	2	47
Drafting Trades	4	4	2	3	2	15	0	0	0	0	0	0
Needle Trades	0	0	0	0	0	0	0	1	4	9	3	17
Dry Cleaning and Finishing	0	0	0	0	0	0	0	4	2	0	5	11
Electrical Trades	5	7	5	5	5	27	0	0	0	0	0	0
Industrial Electronics	9	7	3	6	3	28	0	0	0	1	0	1
Leather Trades	4	1	6	2	1	14	0	0	0	1	1	2
Metal Trades	9	8	5	3	2	27	0	0	0	1	0	1
Mill Cabinetmaking	1	1	3	0	1	6	0	0	0	0	0	0
Piping Trades	0	1	1	2	2	6	0	0	0	0	0	0
Printing	0	0	1	2	4	7	1	1	3	4	9	18
Radio and Television Servicing	0	0	3	1	4	8	1	0	0	0	0	1
Refrigeration and Air Conditioning	2	0	1	3	1	7	0	0	0	0	5	5

*Total.

Data in Table XV show the responses of 82 (77.4 per cent) of the 106 ninth-grade boys and 65 (57 per cent) of the 114 ninth-grade girls who completed the questionnaire.

TABLE XV
DATA CONCERNING INTEREST IN VOCATIONAL-INDUSTRIAL
EDUCATION COURSES BY 147 NINTH-GRADE STUDENTS

Courses	Frequency of Interest in 1, 2, 3, 4, and 5 Order											
	Boys						Girls					
	1	2	3	4	5	T*	1	2	3	4	5	T
Appliance Repair	1	2	1	1	0	5	0	0	0	0	0	0
Aircraft Mechanics	14	10	7	2	3	36	1	0	0	1	0	2
Automobile Mechanics	18	15	7	4	4	48	0	2	1	0	0	3
Building Construction Trades	8	9	10	3	2	32	0	0	0	1	1	2
Commercial Art	5	2	3	1	2	13	15	7	2	2	0	26
Commercial Cooking	0	0	2	1	0	3	9	8	5	3	4	29
Commercial Photography	2	3	4	1	2	12	4	7	2	4	0	17
Cosmetology	1	0	0	0	0	1	34	11	5	1	3	54
Drafting Trades	1	2	3	3	4	13	0	1	0	1	0	2
Needle Trades	0	0	0	0	0	0	1	7	4	2	2	16
Dry Cleaning and Finishing	2	1	0	0	0	3	0	1	3	2	0	6
Electrical Trades	4	8	8	3	5	28	0	0	0	0	0	0
Industrial Electronics	14	3	11	3	3	34	0	0	1	0	0	1
Leather Trades	4	3	2	3	3	15	0	0	2	1	0	3
Metal Trades	2	5	3	9	4	23	0	0	0	0	0	0
Mill Cabinetmaking	2	3	2	7	2	16	0	0	0	0	0	0
Piping Trades	0	2	0	2	1	5	0	0	0	0	0	0
Printing	2	1	1	4	3	11	1	4	6	1	5	17
Radio and Television Servicing	1	2	1	6	4	14	0	0	0	2	0	2
Refrigeration and Air Conditioning	1	1	1	0	4	7	0	0	0	0	0	0

*Total.

The ninth-grade boys chose automobile mechanics 48 times, and 18 were first choices. Aircraft mechanics was chosen 36 times, and 14 were first choices. There was one ninth-grade boy who indicated that he would not take courses listed on the checklist if he had the opportunity.

Fifty-four (83.9 per cent) of the ninth-grade girls indicated an interest in cosmetology, being the first choice of 34 of the girls. Commercial art was chosen 26 times, and 9 were first choices. When asked whether they would like to take any of the courses listed on the checklist, 58 (89.2 per cent) of the ninth-grade girls indicated they would.

The Texas State Education Agency set forth four important considerations to be used in planning vocational-industrial education programs. Two of these were the "determination of the employment opportunities in the area served by the school in various types of gainful employment" and that "students contemplated to be enrolled must have the interest, aptitudes and ability necessary to benefit from the program."³ The first consideration was accomplished by the previously mentioned occupational survey conducted by the Texas Education Agency. In order to comply with the second consideration, data and information concerning

³Texas Education Agency, Guide for Public Schools in Planning Programs of Vocational Education for In-School Students (Austin, September, 1966), p. 3.

guidance and counseling services for Monahans High School were necessary.

The guidance department personnel of Monahans High School consist of one certified secondary counselor. Tables XVI, XVII, XVIII, and XIX present data concerning students receiving guidance.

Data in Table XVI show that of the 116 twelfth-grade students answering the questionnaire, 20 (27.4 per cent) of the boys and 5 (11.6 per cent) of the girls, making a total of 25 (21.6 per cent) of the twelfth-grade students, did not know that they could talk to the school counselor about occupational training. In contrast to this, data in Table XVI also show that 62 (84.9 per cent) of the boys and 29 (67.4 per cent) of the girls, making a total of 91 (78.4 per cent) of the students, had talked to the counselor about attending college. The data presented in Table III, page 19, show that 64 (87.7 per cent) of the boys and 33 (77.2 per cent) of the girls, making a total of 97 (83.6 per cent) of the students, were planning to attend college. Six (5.2 per cent) of the twelfth-grade students who planned to enter college did not receive advice from the counselor. There were 11 students, 4 boys and 7 girls, representing 9.5 per cent of the twelfth-grade students, who planned to attend some type of trade school after graduation. When these students were asked whether they had talked to the counselor

TABLE XVI
 RESPONSES OF 116 TWELFTH-GRADE STUDENTS
 CONCERNING GUIDANCE SERVICES

Question	Responses (N = 116)							
	Boys				Girls			
	Yes	%	No	%	Yes	%	No	%
Have you talked to a counselor about job training?	13	17.8%	60	82.2%	9	20.9%	34	79.1%
Have you talked to a counselor about trade school training?	6	8.2	67	91.8	3	7.0	40	93.0
Have you talked to a counselor about attending college?	62	84.9	11	15.1	29	67.4	14	32.6
Do you know that you can talk to the counselor about occupational training?	53	72.6	20	27.4	38	88.4	5	11.6

about trade school training, 6 boys and 3 girls had sought this information from the counselor. Thirteen (17.8 per cent) of the boys and 9 (20.9 per cent) of the girls had talked to the counselor about job training.

Data in Table XVII reveal the responses of 145 eleventh-grade students to questions concerning guidance services. Seventeen (23.3 per cent) of the boys and 15 (20.8 per cent) of the girls did not know that they could talk to the counselor about occupational training. The data in Table IV, page 20, indicate that 54 boys and 39 girls plan to attend college, but only 34 boys and 19 girls had talked to the counselor about attending college. Three eleventh-grade students had talked to the counselor about trade school training. The data in Table IV also show that 12 boys and 32 girls had planned to attend some type of trade school. Eight (10.9 per cent) of the boys and 6 (8.3 per cent) of the girls had talked with the counselor about job training.

Data in Table XVIII show that 42 (39.3 per cent) of the boys and 27 (29.7 per cent) of the girls or a total of 69 (34.8 per cent) of the 198 tenth-grade students did not know that they could talk to the counselor about job training. Only 6 boys and 7 girls (6.6 per cent) of the tenth-grade students had talked to the counselor about job training. Twenty-eight (26.2 per cent) of the boys and 18 (19.8 per cent) of the girls had talked to the counselor about

TABLE XVII
 RESPONSES OF 145 ELEVENTH-GRADE STUDENTS
 CONCERNING GUIDANCE SERVICES

Question	Responses							
	Boys				Girls			
	Yes	%	No	%	Yes	%	No	%
Have you talked to a counselor about job training?	8	17.9%	65	89.1%	6	8.3%	66	91.7%
Have you talked to a counselor about trade school training?	2	2.7	71	97.3	1	1.4	71	98.6
Have you talked to a counselor about attending college?	34	45.6	39	53.4	19	26.4	53	73.6
Do you know that you can talk to the counselor about occupational training?	56	76.7	17	23.3	57	79.2	15	20.8

TABLE XVIII
 RESPONSES OF 198 TENTH-GRADE STUDENTS
 CONCERNING GUIDANCE SERVICES

Question	Responses							
	Boys				Girls			
	Yes	%	No	%	Yes	%	No	%
Have you talked to a counselor about job training?	6	5.6%	101	94.4%	7	7.7%	84	92.3%
Have you talked to a counselor about trade school training?	2	1.9	105	98.1	2	2.2	89	97.8
Have you talked to a counselor about attending college?	28	26.2	79	73.3	18	19.8	73	80.2
Do you know that you can talk to the counselor about occupational training?	65	60.7	42	39.3	64	70.3	27	29.7

attending college. The data presented in Table V, page 21, show that 96 (86.9 per cent) of the boys and 53 (57.1 per cent) of the girls planned to attend college. Two (1.9 per cent) of the boys and 2 (2.2 per cent) of the girls had talked to the counselor about trade school training; however, the data in Table V show that 20 (18.7 per cent) of the boys and 26 (28.7 per cent) of the girls planned to attend some type of trade school upon graduation from high school.

The data in Table XIX show the responses of 217 ninth-grade students concerning guidance services. Thirty-seven (34.9 per cent) of the boys and 34 (30.6 per cent) of the girls did not know that they could obtain occupational training information from the school counselor. Only two (1.9 per cent) of the boys and 2 (1.8 per cent) of the girls had talked to the counselor about job training. The data presented in Table VI, page 22, indicate that 20 (18.9 per cent) of the ninth-grade boys and 20 (18 per cent) of the ninth-grade girls planned to attend some type of trade school after high school graduation, but none of the girls or boys had talked to the counselor about trade school training. Only 10 (9.4 per cent) of the 86 (81.1 per cent) ninth-grade boys planning to attend college had talked to the counselor about going to college. Only sixteen (14.4 per cent) of the 77 (69.4 per cent) ninth-grade girls planning to attend college had talked to the counselor about going to college.

TABLE XIX

RESPONSES OF 217 NINTH-GRADE STUDENTS
CONCERNING GUIDANCE SERVICES

Question	Responses							
	Boys				Girls			
	Yes	%	No	%	Yes	%	No	%
Have you talked to a counselor about job training?	2	1.9%	104	98.1%	2	1.8%	109	98.2%
Have you talked to a counselor about trade school training?	0	0.0	106	100.0	0	0.0	111	100.0
Have you talked to a counselor about attending college?	10	9.4	96	90.6	16	14.4	95	85.6
Do you know that you can talk to the counselor about occupational training?	69	65.1	37	34.9	77	69.4	34	30.6

Of the 676 students answering the questionnaire, 53 (7.8 per cent) of them had talked to the counselor about job training. The data reveal that 197 (29.1 per cent) of the students did not know that they could talk to the counselor about occupational training. One hundred and forty (20.7 per cent) of these 197 students (29.1 per cent) were enrolled in the ninth and tenth grades.

In the ninth, tenth, eleventh, and twelfth grades, there were 141 students who planned to attend some type of trade school, and the data reveal that only 16 (11.3 per cent) had talked to the counselor. The data also reveal that only 216 (31.9 per cent) of the students had talked to the counselor about attending college, although 502 (74.3 per cent) of the students indicated they planned to attend college.

Other duties assigned to the counselor for the 1967-1968 school year included counseling 837 high school students, serving as book custodian for the high school, and assuming the clerical duties associated with all course scheduling for the entire high school.

Another factor to be considered in planning a vocational education program to meet the community's needs is the mobility factor. Coe and Zanzalari, in a study made in 1963, found that the high school graduates tend to live in their home county after graduation. About 88 per cent of their

lives would be spent in their own counties. This may suggest that skilled workers tend to move not far from where they were reared and educated.⁴ The data compiled in this study revealed that the mobility rate is relatively low in the Monahans-Wickett-Pyote Independent School District.

Each student answering the questionnaire was asked how long he had lived in the school district and how long his father had been employed in his present occupation, and it was found that 116 twelfth-grade students had lived in the school district for an average of 11.6 years. The fathers of these 116 senior students had been employed in their present occupation for an average of 15.9 years. This figure did not include 1 retired and 5 deceased fathers. The 145 eleventh-grade students had lived in the school district for an average of 9.3 years, and their fathers had been employed in their present occupation for an average of 13.5 years. This figure included 8 unemployed fathers, but did not include 3 who were deceased. The 198 tenth-grade students had lived in the school district an average of 9.4 years. The tenth-grade students' fathers had been employed in their present occupations for an average of 13.6 years. This figure did not include 9 unemployed fathers, two retired fathers, and three fathers who were deceased. There

⁴Willa Norris, Franklin R. Zeran, and Raymond N. Hatch, The Information Service in Guidance (Chicago, 1960), p. 311.

were 217 ninth-grade students who had lived in the school district for an average of 9.1 years, and their fathers had been employed in their present occupations for an average of 12.4 years. This figure did not include 4 retired and 10 deceased fathers; it did, however, include 9 who were unemployed at the time the questionnaire was completed.

The data presented in this chapter indicate that the students in the Monahans-Wickett-Pyote Independent School District are relatively immobile. Therefore, if these students were vocationally trained to the requirements of the community needs, it seems likely that they will seek occupations in the community which trained them.

Information presented in the preceding pages indicates that the students in Monahans High School were interested in courses in cosmetology, automobile mechanics, commercial art, industrial electronics, aircraft mechanics, building construction trades, electrical trades, and the metal trades.

An occupational survey conducted by the Texas Education Agency indicates a need in the community for training in all the fields in which the students were interested except in commercial art and aircraft mechanics. Emphases in this study were placed on physical facilities, tools and equipment, and organization of courses in automobile mechanics, general machine work, and the metal trades.

CHAPTER III

INFORMATION CONCERNING SKILLS

EMPHASIZED BY EMPLOYERS

This chapter presents data concerning phases of instruction which local employers in the fields of automobile mechanics, general machine work, and metal trades indicated would be important to a student seeking employment in their firms. This part of the study was believed to be important because in order for vocational-industrial education to be successful in a community, all aspects of the program should be realistic in the light of actual or anticipated opportunities for gainful employment, and the courses must be suited to the needs, interest, and ability of students who are to benefit from such a program.¹

Recently, in an extensive, in-depth study of the U. S. Office of Education, a subcommittee examining the Division of Vocational and Technical Education "was somewhat critical of the program of developing 'suggested curriculum guides' in that the review committees seemed to be academically

¹Texas Education Agency, Guide for Public Schools in Planning Programs of Vocational Education for In-School Students (Austin, 1966), p. 1.

oriented with little representation from the business community."²

The Texas Education Agency sets forth the following regulation pertaining to instruction:

Instruction is based upon an analysis of the trades or occupations taught and is centered around the performance of useful or productive jobs or operations done by students in accordance with the accepted procedures and standards which prevail in the occupation taught. After the student has gained sufficient skill and knowledge of various operations through laboratory experiences, he should be assigned real or "live" jobs provided by patrons of the school. No charges other than for parts, supplies and materials can be made for such work.³

An interview was held with a representative of every established firm engaged in the fields of automobile mechanics, general machine work, and other metal trades located in the Monahans-Wickett-Pyote Independent School District. The interviews were in May, 1968. During the interviews a checklist was completed by the various representatives to determine what phases of instruction should be stressed to better qualify individuals for present and future employment in the community. The interviews were conducted with either the shop foreman or owner of each of the firms.

²Walter M. Arnold, "Washington Report," Industrial Arts and Vocational Education, LVII (February, 1968), 2.

³Texas Education Agency, op. cit., p. 71.

The data in Table XX were taken from the checklist completed during an interview with a representative from each of nine established automobile repair shops. The nine firms

TABLE XX

DATA CONCERNING THE DEGREE OF SKILLS RECOMMENDED
IN THE VARIOUS PHASES OF AUTOMOBILE
MECHANICS BY NINE EMPLOYERS

Phases of Automobile Mechanics	Degree of Skill Preferred by Nine Employers		
	Semi- Skilled	Skilled	Highly Skilled
History of Automobile	8	1	0
Automobile Design	8	1	0
Auto Shop Practices	5	3	1
Auto Shop Safety	2	1	6
Care of Tools	2	4	3
Machine Tool Maintenance	0	7	2
Power Plant Construction	3	4	2
Engine Types	3	6	0
Gasoline Engines	0	5	4
Piston Assemble	0	6	3
Connecting Rod	0	6	3
Crankshaft Assemble	0	5	4
Flywheel	3	4	2
Valve Assemble	0	5	4
Bearings	0	5	4
Lubrication System	1	5	2
Intake Manifold	3	4	2
Exhaust Manifold	4	4	1
Clutch	2	5	1
Fuel System	0	5	4
Engine Fuels	2	6	1
Chemistry of Combustion	6	1	2
Fuel Feed	3	5	1
Carburetors	2	1	6
Air Cleaners	8	1	0
Cooling Systems	3	3	3
Electrical Theory	2	5	2
Battery	8	1	0

TABLE XX --Continued

Phases of Automobile Mechanics	Degree of Skill Preferred by Nine Employers		
	Semi- Skilled	Skilled	Highly Skilled
Starting Motor	1	7	1
Generator	0	7	2
Generator Controls	0	5	4
Alternator	0	4	5
Ignition System	0	2	7
Electrical Accessories	0	5	4
Gear Operating Principles	5	3	1
Standard Transmission	3	4	2
Drive Shafts	7	2	0
Universal Joints	7	2	0
Differentials	4	5	0
Axles	7	2	0
Brakes	2	5	2
Wheel Alignment	3	2	4
Steering Gears	3	4	2
Frames	7	2	0
Wheels	8	1	0
Tires	8	1	0
Springs	8	1	0
Stabilizers and Shocks	8	1	0
Automatic Transmissions	0	1	8

employ fifty-two mechanics who reside in the school district. The representative of each firm was asked to check each item showing the degree of skill which he believed would be needed or desirable to qualify a student for employment in his firm. The data indicate that the representatives of the automobile mechanics firms located in the school district would prefer to have mechanics who were highly skilled in work pertaining to automatic transmissions, ignition systems,

auto shop safety, carburetors, generator controls, and alternators. Of the nine representatives completing the checklist, five of the representatives considered a high degree of skill was desirable in all of the various phases of automobile mechanics listed in Table XX.

Each representative interviewed was asked to list in order of preference the five phases of automobile mechanics which he believed should be stressed in a course designed to prepare automobile mechanics. The preferences listed showed ignitions systems was selected ten times as the chief concern of the automobile mechanics. Other selections in order of preference were accessory repairs, automatic transmission, fuel systems, engine overhaul, brake systems, differential overhaul, alignment work, and oil systems.

The data in Table XXI were taken from the checklist completed by the representatives operating the eight established metalworking firms with a total employment of twenty-four shop personnel. The eight firms were engaged primarily in welding and general machine work. Each of the representatives was asked to check each item indicating the degree of skill which he believed would better prepare a student for employment in his establishment. The data show that 50 per cent or more of the representatives indicated the students should be highly skilled in electric arc welding, blueprint reading, shop safety, oxyacetylene

brazing, oxyacetylene cutting, tool care, shop mathematics, measuring tools, and layout tools.

The representatives of each of the firms were asked to list in order of importance the phases of metalworking which they believed should be emphasized in a training program. Layout, welding, acetylene cutting, maintenance of equipment, metallurgy, and precision work were the only phases which were listed more than one time.

TABLE XXI

DATA CONCERNING THE DEGREE OF SKILLS RECOMMENDED IN VARIOUS PHASES OF METAL TRADES BY EIGHT EMPLOYERS

Phases of Metal Trades	Degree of Skill Preferred by Eight Employers		
	Semi-Skilled	Skilled	Highly Skilled
Shop Procedures	5	2	1
Shop Safety	1	2	5
Tool Care	1	3	4
Machine Tool Maintenance	2	4	1
Blueprint Reading	1	1	6
Pattern Drafting	5	2	1
Mechanical Drawing	2	4	2
Hand Tools	3	5	0
Shop Math	2	2	4
Measuring Tools	2	2	4
Layout Tools	2	2	4
Vises and Clamps	7	1	0
Gauges	5	2	1
Drills	1	6	1
Abrasives	2	5	1
Taps and Dies	5	2	1
Power Hacksaw	5	0	3
Drill Press	3	2	3
Hand Drills	2	4	2

TABLE XXI --Continued

Phases of Metal Trades	Degree of Skill Preferred by Eight Employers		
	Semi- Skilled	Skilled	Highly Skilled
Engine Lathe	4	2	2
Shaper	5	2	1
Vertical Milling Machine	5	1	2
Horizontal Milling Machine	5	1	2
Oxyacetylene Brazing	0	3	5
Oxyacetylene Cutting	0	3	5
Oxyacetylene Welding	2	3	3
Electric Arc Welding	0	1	7
Sheet Metal Work	7	1	0
Sheet Metal Layout	7	1	0
Bending Tools	7	0	1
Soldering	6	2	0
Forming Equipment	8	0	0
Tool Crib Work	8	0	0
Inventory Records	7	1	0
Turret Lathe	6	0	2
Grinding Machines	2	4	2
Band Saw	7	1	0
Sander	7	1	0

The data in Table XXII were taken from a checklist completed during interviews with the owner or operators of the three machine shops located in the school district. The three firms employ a total of twelve people. The three machine shops are primarily job shops, equipped to handle oil field repair work.

The data show that two of the three firms wanted their employees to be highly skilled in shop safety, tool care, blueprint reading, and mechanical drawing. The three

representatives placed varying degrees of emphasis on the proper use and operation of measuring tools, drill presses, engine lathes, vertical milling machines, horizontal milling machines, oxyacetylene brazing, oxyacetylene welding, electric arc welding, turret lathes, and grinding machines.

When asked to list in order of importance the phases of instruction in machine work which should be emphasized in a vocational machine shop course, the representatives listed work involving the engine lathe, milling machine, and drill press most frequently. Other phases of instruction appearing on the list were maintenance of machines, set ups, metallurgy, grinding, and use of the shaper.

TABLE XXII

DATA CONCERNING THE DEGREE OF SKILLS RECOMMENDED IN THE VARIOUS PHASES OF MACHINE SHOP BY THREE EMPLOYERS

Phases of Machine Shop	Degree of Skill Preferred by Three Employers		
	Semi-Skilled	Skilled	Highly Skilled
Shop Procedures	2	1	0
Shop Safety	1	0	2
Tool Care	0	1	2
Machine Tool Maintenance	0	3	0
Blue Print Reading	1	0	2
Pattern Drafting	3	0	0
Mechanical Drawing	1	0	2
Hand Tools	1	2	0
Shop Math	1	1	1
Measuring Tools	0	1	2
Layout Tools	2	0	1
Vises and Clamps	3	0	0

TABLE XXII --Continued

Phases of Machine Shop	Degree of Skill Preferred by Three Employers		
	Semi- Skilled	Skilled	Highly Skilled
Gauges	1	2	0
Drills	0	3	0
Abrasives	1	2	0
Taps and Dies	1	2	0
Power Hacksaws	2	0	1
Drill Press	0	1	2
Hand Drills	1	1	1
Engine Lathe	1	1	1
Shaper	1	1	1
Vertical Milling Machine	1	0	2
Horizontal Milling Machine	1	0	2
Oxyacetylene Brazing	0	1	2
Oxyacetylene Cutting	0	2	1
Oxyacetylene Welding	0	1	2
Electric Arc Welding	0	1	2
Sheet Metal Work	2	1	0
Sheet Metal Layout	2	0	1
Bending Tools	3	0	0
Soldering	1	2	0
Forming Equipment	3	0	0
Tool Crib Work	3	0	0
Inventory Records	2	1	0
Turret Lathe	1	0	2
Grinding Machines	0	1	2
Band Saw	2	1	0
Sanders	2	1	0

In the development of a detailed course of study, the vocational-industrial teacher should carefully study the objectives of his school, the objectives of vocational-industrial education, and the content that should be included in a vocational-industrial course of study. Information and data presented in this chapter indicate where emphasis

should be placed with respect to knowledge and skills needed to better prepare the student for gainful employment in the community. The data will also be helpful as a guide when purchasing tools and equipment to be used in the laboratories.

CHAPTER IV

INFORMATION CONCERNING EQUIPMENT AND COST

Information concerning equipment recommended for use in a program designed to develop a high degree of skill in automobile mechanics, metal trades, and general machine work is presented in this chapter. Cost estimates of the equipment are also included. The information pertaining to equipment needed for the instruction in metal trades and general machine work is combined, since these areas of instructional work are interrelated and require many items of like equipment. Information concerning equipment and its cost that will be needed in vocational automobile mechanics instruction will be presented separately. Data concerning the cost of equipment were taken from previous studies and compared with current catalog list prices and do not include any educational or quantity discounts.

The Texas Education Agency sets forth regulations pertaining to equipment, tools, and supplies. They are as follows:

Items of equipment, tools and supplies must be comparable in type, size and quality to those used in commercial establishments. It is the school's obligation to keep equipment up to date and in a state of good repair. The teacher should maintain an inventory

of all equipment and should submit a list of needed equipment and supplies to the administrator at the end of each term.¹

During interviews with representatives of the seventeen firms connected with metal trades and automobile mechanics, they were asked to list major machines used in each of their firms. The machines were listed and used in most of the seventeen firms. The representatives stated there was very little difference in the products of most manufacturers and that any established manufacturer of high quality equipment could furnish equipment suitable for equipping a vocational-industrial education laboratory.

The Texas Education Agency states that no more than fifteen students should be enrolled in any one laboratory course.² One criterion used in the selection of equipment for the previously mentioned vocational courses was based on the assumption that there will be a maximum of fifteen students in each class.

In order to determine what constitutes adequate or desirable tools and equipment for courses in metal trades and general machine work in vocational education, a study of current literature pertaining to tools and equipment recommended for use in those courses was made. A tool and

¹Texas Education Agency, Guide for Public Schools in Planning Programs of Vocational Education for In-School Students (Austin, September, 1966), p. 71.

²Ibid., p. 70.

equipment list prepared by the Texas Education Agency and the Engineering Extension Service, Texas A and M University in the summer of 1958 and revised in July, 1964,³ was compared with tool and equipment checklists prepared by the Tennessee State Department of Education,⁴ Hutchings,⁵ and Johnson.⁶ It was found that the tool and equipment lists were very similar; however, the latter provided no cost information. The list prepared by the Texas Education Agency and Texas A and M University gave quantity and cost of all tools and equipment recommended, as shown in Table XXIII.

TABLE XXIII

A SUMMARY OF TOOLS AND EQUIPMENT COST FOR
METAL TRADES AND MACHINE SHOP*

Equipment Summary	Cost
Basic Tools to All Areas	\$ 2,203.00
Welding Unit	2,528.00
Sheet Metal Unit	2,780.00
Machine Shop Unit	<u>64,280.00</u>
Estimated Total Cost	\$71,791.00

*Allen and others, op. cit., p. 85.

³C. M. Allen and others, Suggested Basic Course Outline for Metal Trades (College Station, 1964), p. 80.

⁴"Equipping the General Metals Shop," Modern School Shop Planning (Ann Arbor, Michigan, 1955), p. 159.

⁵"Equipment and Supply Listings," Industrial Arts and Vocational Education, L (March, 1961), 76.

⁶Harold V. Johnson, "Metalworking," Industrial Arts and Vocational Education, XLIX (March, 1960), 110.

A comparison of individual studies developed in August, 1966, by graduate students at North Texas State University shows that the cost of tools and equipment was approximately the same as the cost of the equipment in the list prepared by the Texas Education Agency and Texas A and M University. Studies by Wade,⁷ showing tools and equipment for metalworking, and Fielding,⁸ showing tools and equipment for general machine work, presented an estimated cost of \$73,543 for tools and equipment suggested for use in courses in metalworking and general machine work. These studies were compared, and duplicated equipment was omitted. Similar studies made by Dillard⁹ and Perry¹⁰ show an estimated cost of \$65,299.

A study of a current catalog¹¹ supplied by one of the

⁷Hearn Wade, "Specifications for Metalworking Equipment," unpublished report on file, Department of Industrial Arts, North Texas State University, Denton, Texas, 1966, pp. 1-11.

⁸Frank T. Fielding, "A Floor Plan and Equipment List for a Unit Type Industrial Arts Laboratory," unpublished report on file, Department of Industrial Arts, North Texas State University, Denton, Texas, 1966, pp. 1-17.

⁹Ray Dillard, "Equipment List for a Machine Laboratory in Industrial Arts," unpublished report on file, Department of Industrial Arts, North Texas State University, Denton, Texas, 1966, pp. 1-4.

¹⁰Roy N. Perry, "Proposed Specifications for Metalworking Equipment," unpublished report on file, Department of Industrial Arts, North Texas State University, Denton, Texas, 1966, pp. 1-12.

¹¹Brodhead-Garrett (Cleveland, Ohio, 1968).

leading distributors of tools, equipment, and supplies for schools with industrial-vocational programs, reveals that there has been an increase of 19.6 per cent in the cost of the tools and equipment in the past two years. Other factors to be considered in the cost difference are the quality of equipment originally priced and educational and quantity discounts.

The tool and equipment list prepared by the Texas Education Agency and the Engineering Service of Texas A and M University in the summer of 1968 and revised in July, 1964,¹² for use in automobile mechanics courses was compared to checklists prepared by Genske,¹³ Hutchings,¹⁴ Trudeau,¹⁵ and The Automobile Manufacturers Association, Inc.¹⁶ All of these were found to be very similar.

A summary of cost of the tools and equipment prepared by the Texas Education Agency and Texas A and M University is shown in Table XXIV.

¹²C. M. Allen and others, Suggested Basic Course Outline for Automobile Mechanics (College Station, Texas, 1964), p. 79.

¹³Harvey Genske, "Automotive," Industrial Arts and Vocational Education, XLIX (March, 1960), 115.

¹⁴"Equipment and Supply Listings," p. 92.

¹⁵Terence Trudeau, "Equipment for Industrial Arts Power and Automotive Mechanics," Industrial Arts and Vocational Education, LVII (March, 1968), 120.

¹⁶"Equipping the Automotive Shop," Modern School Shop Planning (Ann Arbor, Michigan, 1955), p. 96.

TABLE XXIV

A SUMMARY OF TOOLS AND EQUIPMENT COST
FOR AUTOMOBILE MECHANICS*

	Cost
Minimum Shop	\$ 8,000.00
Efficient Shop	15,000.00
Desirable Shop	20,000.00

*Allen and others, Suggested Basic Course Outline for Automobile Mechanics, p. 83.

Based upon the information presented in the aforementioned studies, the cost of the tools and equipment needed for vocational courses in automobile mechanics, metal trades, and general machine work would be approximately \$91,700.

CHAPTER V

DATA CONCERNING SPACE REQUIREMENTS AND ESTIMATED COST OF PHYSICAL FACILITIES FOR METAL TRADES, GENERAL MACHINE WORK, AND AUTOMOBILE MECHANICS

Data presented in this chapter concern recommended space requirements and estimated cost of needed facilities for instruction in automobile mechanics, general machine work, and metal trades.

Vocational-industrial education has a distinct and important function in the schools as a definite phase of vocational education. Its aims and objectives are specific and are derived from results of a community industrial survey, which reveals what trades or other industrial occupations are in need of trained workers.¹ The design of laboratories, which are to be used for training of students, should be based on the aims and objectives of the vocational courses to be taught. Although the design of these facilities was not treated in this study, note was made to emphasize the aims, objectives, and goals of the vocational courses being taught.

¹Arthur B. Mays, "Planning for Industrial Education," Modern School Shop Planning (Ann Arbor, Michigan, 1965), p. 10.

A review of recent studies and articles was made to obtain information pertaining to space requirements needed for instruction in courses in the metal trades, general machine work, and automobile mechanics. The studies indicate that very little, if any, difference in space requirements existed between facilities for industrial arts and vocational-industrial education. Mays stated that ". . . the equipment, methods of instruction, and the character of work done differ little, if any. . . ." ² Therefore, since indications were that facilities for industrial arts at the high-school level and vocational-industrial education are the same, a recent study conducted by Campbell ³ was used to determine space requirements for instructional facilities in the previously mentioned courses. The set of standards prepared by Campbell for use in planning physical facilities for industrial arts should be useful as a guide for future study when the design of the facilities to be constructed is undertaken.

Table XXV shows space standards used to determine physical facility space requirements for courses in automobile mechanics, metal trades, and general machine work.

²Ibid.

³Bernice S. Campbell, "A Study to Develop Standards for Use in Planning or Renovating Industrial Arts Laboratories in Public Schools," unpublished master's thesis, North Texas State University, Denton, Texas, 1968.

TABLE XXV
 DATA CONCERNING RECOMMENDED
 SPACE FOR FACILITIES*

Facilities	Desirable Space Standards for Courses		
	Automobile Mechanics	Metal Trades	General Machine Work
Square feet of floor area per 15 students exclusive of storage, planning area, <u>etc.</u>	2250	1875	1875
Storage space for materials and supplies	325	325	325
Storage space for pupils' property (small projects, aprons, <u>etc.</u>)	100	100	100
Storage space for students' large projects	250	250	250
Storage space for equipment (tools, auxiliary machine parts, <u>etc.</u>)	150	100	100
Space for demonstration and/or instructional area inclusive of library and planning area	500	500	500
Space for teacher's office and conference room	150	150	150
Space for finishing room	0	200	200
Space for assembling area	0	200	200
Space for toilet facilities	150	150	150
Total square feet	3875	3825	3825

*Ibid.

The data show that an automobile mechanics laboratory should contain approximately 3875 square feet, and the general machine work and metal trades laboratories should contain approximately 3825 square feet each for a maximum-sized class of fifteen students.

A study conducted by Larson revealed that the cost of facilities for technical education will vary with the geographic area and type of construction.⁴ He indicated that the cost of facilities for technical education will vary from approximately \$12.70 to \$20.00 per square foot with an increase of 2.8 per cent in the past several years.

The last school facility constructed for the Monahans-Wickett-Pyote Independent School District cost approximately \$13.50 per square foot in 1964.⁵ The addition of the 2.8 per cent increase in educational building cost referred to by Larson to the cost of construction in 1964 indicates that the average approximate cost of educational building construction will be approximately \$17.25 per square foot.

Based upon \$17.25 per square foot, the cost of an automobile mechanics laboratory would be approximately

⁴Milton E. Larson, "Labs and Shops for Technical Education," Industrial Arts and Vocational Education, LVII (March, 1968), 35.

⁵Statement by George L. Cullender, Superintendent of Schools, Monahans-Wickett-Pyote Independent School District, Monahans, Texas, October 14, 1968.

\$67,800. Laboratories for metal trades and general machine work would cost approximately \$67,000.

Assuming that a cost of approximately \$201,800 will be the cost of the three laboratories and that the cost of tools and equipment will be approximately \$91,700, the total cost of physical facilities and tools and equipment will be approximately \$293,500.

CHAPTER VI

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The Monahans-Wickett-Pyote Independent School District is located in the northeastern section of Ward County, Texas, and serves an 827-square-mile area, which encompasses the towns of Monahans, Wickett, and Pyote. Monahans High School serves all three towns, and had an enrollment of 827 students during the 1966-1967 school year. Twelve per cent of the students were enrolled in vocational courses at that time. A study of school records showed that 32 per cent of the graduating students between 1961 and 1967 did not enter college and that 36.1 per cent of the students entering the ninth grade in 1963 did not finish high school.

The school district has been planning to expand its vocational education program and to initiate a program of vocational-industrial education. The vocational program presently offered consists of distributive education, home economics, and vocational office practices. An occupational survey was conducted by the Texas Education Agency to determine current and projected employment needs in the area served by the school district. A report of the survey was submitted to the school administration in April of 1967, and

it indicated that the most predominant programs of training which would benefit local industry were automobile mechanics, beauty training, electrical trades, general office practices, safety, and salesmanship.

The purpose of this study was to gather information that would be helpful in planning and implementing a vocational education program for the Monahans-Wickett-Pyote Independent School District and to seek answers to the following questions:

1. In what specific courses in vocational-industrial education are the students of Monahans High School interested?
2. What course content should be stressed to meet community needs in the vocational-industrial education fields of the metal trades, general machine work, and automobile mechanics?
3. What equipment will be needed to provide instruction to a maximum-sized class in the previously mentioned vocational fields, and what will be the approximate cost of this equipment?
4. What size physical facilities will be needed to house the equipment and related instructional areas?
5. What will be the approximate cost of the physical facilities?

The background informational data for the study were taken from an occupational survey conducted by the Texas Education Agency in conjunction with the Monahans-Wickett-Pyote Independent School District. Data concerning students' future plans and interests in vocational-industrial education were gathered by a study of the school's permanent records and a questionnaire completed by 676 students. Information pertaining to what phases of course content should be stressed and what type of tools and equipment were used by industry located in the school district was gathered by interviews and a checklist completed by a representative of each established metalworking and automobile mechanics firm in the school district.

Findings

The data gathered produced the following findings:

1. An analysis of the students' future plans, interest in vocational education, and needs for occupational guidance revealed that 20.9 per cent of the students planned to attend some type of trade school.
2. The greatest interest shown by the students in respect to vocational courses and preparation included secretarial training, cosmetology, and automobile mechanics.
3. Only 7.9 per cent of the students had talked to the counselor about job training, and 29.1 per cent did not know they could talk to the counselor about occupational training.

4. The twelfth-grade students had lived in the school district for an average of 11.6 years; the eleventh-grade students, 9.3 years; the tenth-grade students, 9.4 years; the ninth-grade students, 9.1 years.

5. An analysis of the data concerning phases of training which local employers believed would be needed or helpful to better prepare students for employment in their firms revealed that automobile mechanics, the metal trades, and general machine work were of concern to the firms. The automobile mechanics firms wanted their future employees to be highly skilled in the repair of ignition systems, accessories, automatic transmissions, automobile shop safety, carburetors, and generator controls. Firms engaged in the metal trades indicated their future employees should be highly skilled in layout, welding, oxyacetylene cutting, maintenance of equipment, and precision work. Firms engaged in general machine work wanted their future employees highly skilled in operations involving the metal lathe, milling machine, and drill press.

6. The cost for tools and equipment was estimated to be \$91,700 for an instructional program designed to develop a high degree of skill in automobile mechanics, the metal trades, and general machine work.

7. The research indicated that the physical facilities for courses in automobile mechanics, the metal trades, and

general machine work should contain approximately 11,525 square feet of floor space. The estimated cost for the physical facilities would be \$201,800.

Conclusions

Based upon the findings of this study, the following conclusions were drawn:

1. There is a need for vocational training in Monahans High School.
2. A need exists in the community for training in cosmetology, automobile mechanics, and industrial electronics.
3. Students are not taking advantage of the opportunity to confer with the guidance counselor concerning occupational training.
4. The scholastic population of the community is fairly stable, indicating that an individual trained for employment in the community in which he was reared is likely to seek employment in that community.
5. An extensive course in general metal trades would meet the needs of industry and the community.

Recommendations

As a result of this study, the following recommendations were made:

1. A program of vocational-industrial education should be organized for high school students in grades eleven and twelve at Monahans High School, and courses in automobile mechanics and the metal trades should be included in this program.

2. A committee composed of school administrators and local business patrons should be appointed to determine whether any other courses in vocational education should be offered in the interest of the students, the community, and the school system.

3. The existing guidance department should be enlarged to meet the needs of the students, and vocational guidance should be inaugurated into the department.

4. A committee of representatives from firms involved in automobile mechanics and metal trades should be appointed to assist school personnel in developing a course of study for automobile mechanics and the metal trades.

5. A thorough study of the surrounding communities should be made to determine the need for an area vocational school in addition to or in lieu of a vocational school for the Monahans-Wickett-Pyote Independent School District.

APPENDIX A

June 15, 1967

Mr. Frank Fielding
Western Mobil Lodge
#15
Denton, Texas

Dear Mr. Fielding:

In reply to your inquiry concerning information that would be helpful in planning and implementing a vocational education program in this district, the following types of information would be of value:

(a) A cost analysis of equipment and facilities that would be needed to implement a program of vocational education in grades 7, 8 and 9. (This program is referred to at the Agency as a cluster of Vocational Occupations.)

(b) The same information on auto mechanics, metal or machine shop. (The course content of this last course to be designed to fit local needs)

In addition to all of the above, it would be well to consider the development of an area vocational school over a period of time as the program progresses.

Included in all of this would be personnel costs and possible sources of funding and any other attendant problems that might be incurred.

Sincerely,

(Signed) George Cullender

George Cullender
Superintendent

GC:dg

APPENDIX B

Name _____ Address _____
Last First Number Street
Town

Age _____ Grade _____

Male _____ Female _____

PLEASE CHECK ALL ITEMS REGARDLESS OF WHETHER OR NOT YOU PLAN TO ATTEND COLLEGE.

1. How long have you lived in the Monahans-Wickett-Pyote School District?

Years Months

2. What is your father's occupation? _____

Approximately how long has this been his occupation?

3. Do you plan to graduate from high school? Yes ___ No ___
Do you plan to attend college? Yes ___ No ___

4. Do you plan to attend a trade school after graduation?
Yes ___ No ___

5. Do you plan to quit high school before graduation and attend trade school? Yes ___ No ___

6. Do you plan to quit high school and go to work? Yes ___
No ___

7. If your answer to question #6 is "yes," what type of work do you plan to do? _____

8. What occupation or profession do you plan to make your life's work?

9. Check the vocational courses which you would be interested in taking to prepare yourself for an occupation. (See pages 4-7 for course explanations.)

- | | |
|---|---|
| <input type="checkbox"/> Appliance Repair | <input type="checkbox"/> Building Construction Trades |
| <input type="checkbox"/> Aircraft Mechanics | <input type="checkbox"/> Commercial Art |
| <input type="checkbox"/> Automobile Mechanics | <input type="checkbox"/> Commercial Cooking |
| <input type="checkbox"/> Commercial Photography | <input type="checkbox"/> Metal Trades |
| <input type="checkbox"/> Cosmetology | <input type="checkbox"/> Mill Cabinetmaking |
| <input type="checkbox"/> Drafting Trades | <input type="checkbox"/> Piping Trades |
| <input type="checkbox"/> Needle Trades | <input type="checkbox"/> Printing |
| <input type="checkbox"/> Dry Cleaning and Finishing | <input type="checkbox"/> Radio and Television Servicing |
| <input type="checkbox"/> Electrical Trades | <input type="checkbox"/> Refrigeration and Air Conditioning |
| <input type="checkbox"/> Industrial Electronics | |
| <input type="checkbox"/> Leather Trades | |

10. List in order of your preference your first, second, third, fourth, and fifth choices of the above industrial education courses which you would be interested in taking.

1. _____
2. _____
3. _____
4. _____
5. _____

11. Would you take any of the courses listed above if they were offered in Monahans High School? Yes No

12. Have you talked to a counselor about job training? Yes No

Have you talked to a counselor about trade school training? Yes No

Have you talked to a counselor about attending college? Yes No

Do you know that you can talk to the counselor about occupational training? Yes ___ No ___

13. Do you hold a regular or part-time job? Yes ___ No ___

If "yes," how many hours per school day? _____ How many hours during weekends? _____ What is your salary? _____ How long have you held this job? _____

What type of work do you do? _____

Did you get this job through D. E. (Distributive Education) or V. O. E. (Vocational Office Education) classes? Yes ___ No ___

14. Approximately what is your grade average for all subjects since you have been in high school?

A 90-100 B 80-89 C 70-79 D or Below 69-below

BRIEF SUMMARIES OF THE SUGGESTED VOCATIONAL COURSES

1. APPLIANCE REPAIR--The course involves the study of installing, servicing, and repairing electrical or gas appliances such as fans, heaters, vacuum cleaners, toasters, washing machines, dryers, dishwashers, etc. Appliance repair can also be in specialized fields.
2. AIRCRAFT MECHANICS--The course involves the study of servicing, repairing, and overhauling of all component parts of aircraft. There are specialized fields such as aircraft engine repairs, fuselage repair, etc.
3. AUTOMOBILE MECHANICS--The course involves the study of repairing and overhauling of automobiles, buses, trucks, and other automotive vehicles.
4. BUILDING CONSTRUCTION TRADES--The course involves the study of trades revolving around building construction activities such as concrete work, steel erection, brick laying, carpentry, mill work, blueprint reading, etc.
5. COMMERCIAL ART--This is a study of art involving illustrating for advertisements, books, magazines, posters, billboards, and catalogs.
6. COMMERCIAL COOKING--This is a study of cooking usually for consumption in hotels, cafeterias, cafes, etc.
7. COSMETOLOGY--This course provides instruction in beauty services, such as hair styling, cosmetics services, and scalp conditioning of hygienic or remedial purposes.
8. COMMERCIAL PHOTOGRAPHY--This is a study of photography--equipment used in the photographs of persons, motion picture sets, merchandise, exteriors, interiors, machinery, and fashions to be used in advertising and selling. There are many specialized fields in commercial photography.
9. DRAFTING--This is a course to teach the fundamentals in preparing clear, complete, and accurate working plans and detail drawing from a rough or detail sketch. This field may be very specialized.
10. NEEDLE TRADES--This is a course to train workers engaged in sewing by hand in garment manufacturing establishments. Classifications are made according to type of sewing done such as hand baster, hand feller, or hand sewer.

11. DRY CLEANING AND FINISHING--This is a course to teach the operations of dry-cleaning machines to clean garments, etc. This course gives a knowledge of cleaning processes. Ironing and pressing procedures are also covered.
12. ELECTRICAL TRADES--The course covers plan, layout and repairs of electrical fixtures, apparatus, and control equipment. It provides a general coverage of electrical work.
13. INDUSTRIAL ELECTRONICS--The course applies electrical theory, principles of electrical circuits, electrical testing procedures, engineering mathematics, physics, and related subjects to layout, building, testing, troubleshooting, repairing, and modification of developmental and production electronics equipment, such as computers, missile-control instrumentation and machine tool numerical controls.
14. LEATHER TRADES--This involves the study of leathers for commercial uses, how they are obtained, types, grades, and skills of working with leather goods. The course may be specialized in such trades as leather tanning and equipment, shoe-making and repairs, leather goods for wearing, etc.
15. METAL TRADES--This course will develop the basic working skills, theories, technical information, and related occupational information involved in the metal trades.
16. MILL CABINETMAKING--This course will develop the basic working skills involved in industrial cabinetmaking plants or shops.
17. PIPING TRADES--This course will develop the basic working skills and theories involved in plumbing trades.
18. PRINTING--This is a study of occupations which involve the many methods of printing, such as those used by newspapers, magazines, forms, posters, etc.
19. RADIO AND TELEVISION REPAIR--This course involves training for repairing the radio, TV, and intercom.
20. REFRIGERATION AND AIR CONDITIONING REPAIR--The work involves repair and installation of refrigeration units of different types--those in water coolers, refrigerators, ice-makers, deep freezers, meat lockers and air conditioners.

APPENDIX C

AUTOMOBILE MECHANICS COURSE CONTENT CHECKLIST

This checklist will be used to determine the course content in a two-year vocational automobile mechanics class at the eleventh- and twelfth-grade levels in high school. Please answer the questions, and check each item as to what degree of skill would be more important for employment in your establishment.

1. Name of Firm _____
2. Type of Firm _____
3. Number of Employees _____
4. Specialized Personnel

Office (male) _____	Ignitions _____
Office (female) _____	Brakes _____
Salesmen _____	Electricals _____
Shop Foremen _____	Service Men _____
Parts Men _____	Unit Replacement _____
Custodial _____	Front End Alignment _____
Engine Overhaul _____	Delivery Men _____
Air Conditioning _____	Mechanics Helper _____
Transmission _____	Tool Room Men _____
Differentials _____	Body Men _____

-----CHECK LIST-----

CONTENT	SEMI-SKILLED	SKILLED	HIGHLY SKILLED
1. History of Automobile	()	()	()
2. Automobile Design	()	()	()
3. Auto Shop Practices	()	()	()
4. Auto Shop Safety	()	()	()
5. Care of Tools	()	()	()
6. Machine Tool Maintenance	()	()	()
7. Power Plant Construction	()	()	()
8. Engine Types	()	()	()
9. Gasoline Engine	()	()	()
10. Piston Assemble	()	()	()
11. Connecting Rod	()	()	()
12. Crankshaft Assemble	()	()	()
13. Flywheel	()	()	()
14. Valve Assemble	()	()	()
15. Bearings	()	()	()

CONTENT	SEMI-SKILLED	SKILLED	HIGHLY SKILLED
16. Lubrication System	()	()	()
17. Intake Manifold	()	()	()
18. Exhaust Manifold	()	()	()
19. Clutch	()	()	()
20. Fuel System	()	()	()
21. Engine Fuels	()	()	()
22. Chemistry of Com- bustion	()	()	()
23. Fuel Feed	()	()	()
24. Carburetors	()	()	()
25. Air Cleaners	()	()	()
26. Cooling Systems	()	()	()
27. Electrical Theory	()	()	()
28. Battery	()	()	()
29. Starting Motor	()	()	()
30. Generator	()	()	()
31. Generator Controls	()	()	()
32. Alternator	()	()	()
33. Ignition System	()	()	()
34. Electrical Acces- sories	()	()	()
35. Gear Operating Principles	()	()	()
36. Transmission	()	()	()
37. Drive Shafts	()	()	()
38. Universal Joints	()	()	()
39. Differentials	()	()	()
40. Axles	()	()	()
41. Brakes	()	()	()
42. Wheel Alignment	()	()	()
43. Steering Gears	()	()	()
44. Frames	()	()	()
45. Wheels	()	()	()
46. Tires	()	()	()
47. Springs	()	()	()
48. Stabilizers and Shocks	()	()	()

1. List in order of your preference your first, second, third, fourth, and fifth choices of the phases of automobile mechanics which you think should be stressed in a training course.

1. _____
2. _____
3. _____
4. _____
5. _____

2. List the major machines and your suggested manufacturer of these machines which are used in your shop.

MACHINE	MANUFACTURER
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3. List any suggested tools or equipment that are not listed above which you think would be put to good use in teaching automobile mechanics.

_____	_____
_____	_____
_____	_____
_____	_____

4. Firm representative's signature _____
5. Date _____
6. Interviewer _____

APPENDIX D

THE METAL TRADES AND GENERAL MACHINE WORK

COURSE CONTENT CHECKLIST

This checklist will be used to determine the course content in a two-year vocational training course in the metal trades and general machine work at the eleventh- and twelfth-grade levels in high school. Please answer the questions, and check each item as to what degree of skill would be more important for employment in your establishment.

1. Name of Firm _____
2. Type of Firm _____
3. Number of Employees _____
4. Specialized Personnel

Machinists _____	Office (Male) _____
Welders _____	Office (Female) _____
Sheet metal men _____	Tool Room Men _____
Machine Operators _____	Salesmen _____
Custodians _____	Others _____

-----CHECKLIST-----

CONTENT	SEMI-SKILLED	SKILLED	HIGHLY SKILLED
1. Shop Procedures	()	()	()
2. Shop Safety	()	()	()
3. Tool Care	()	()	()
4. Machine Tool Maintenance	()	()	()
5. Blueprint Reading	()	()	()
6. Pattern Drafting	()	()	()
7. Mechanical Drawing	()	()	()
8. Hand Tools	()	()	()
9. Shop Math	()	()	()
10. Measuring Tools	()	()	()
11. Layout Tools	()	()	()
12. Vises and Clamps	()	()	()
13. Gauges	()	()	()
14. Drills	()	()	()
15. Abrasives	()	()	()
16. Taps and Dies	()	()	()
17. Power Hacksaw	()	()	()
18. Drill Press	()	()	()
19. Hand Drills	()	()	()

1. List in order of your preference your first, second, third, fourth, and fifth choices of the phases of metal working which you think should be stressed in a vocational metal working course.

1. _____
2. _____
3. _____
4. _____
5. _____

2. List the major machines and your suggested manufacturer of these machines which are used in your shop.

MACHINE	MANUFACTURER
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3. List any suggested tools or equipment that are not listed above which you think would be put to good use in teaching the metal trades.

_____	_____
_____	_____
_____	_____
_____	_____

4. Firm representative's signature _____
5. Date _____
6. Interviewer _____

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