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# A Status Study of the Building Trades Programs in the State of Illinois

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A STATUS STUDY OF THE BUILDING TRADES PROGRAMS

IN THE STATE OF ILLINOIS

(TITLE)

BY

Markes Floyd Ervin, Jr.

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

Master of Science in Education

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

1966

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

*July 21, 1966*  
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The writer wishes to express his appreciation to his advisor, Dr. Clifford H. Erwin, Professor of Industrial Arts, for his valuable assistance and time in making proper use of this information.



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## INTRODUCTION

At the turn of the 20th century many people realized the need for formal related instruction in addition to work experience received on the job.

Leaders from labor and management with the help of educators encouraged Congress in 1917 to pass the Smith-Hughes Act. The purpose of this Act was to promote and develop vocational training programs through the secondary public schools. This Act gave the public schools the direct responsibility for supervision and control of the training program.

In 1923, six years after passage of the Smith-Hughes Act, the first vocational building trades program was established in Illinois. This program, known as Day Trade Training "Type B," Building Trades, was set up in the Pana High School with twelve boys enrolled.<sup>1</sup> Mr. S. J. Harrison was the instructor.

The following year, 1924, a similar program was started at Aurora West High School, and the third program got under way at Highland Park in 1925.

Aurora West terminated its program in 1946, and Highland Park's program closed in 1958. Johnson City has the oldest program starting back in 1930 and still in operation today.

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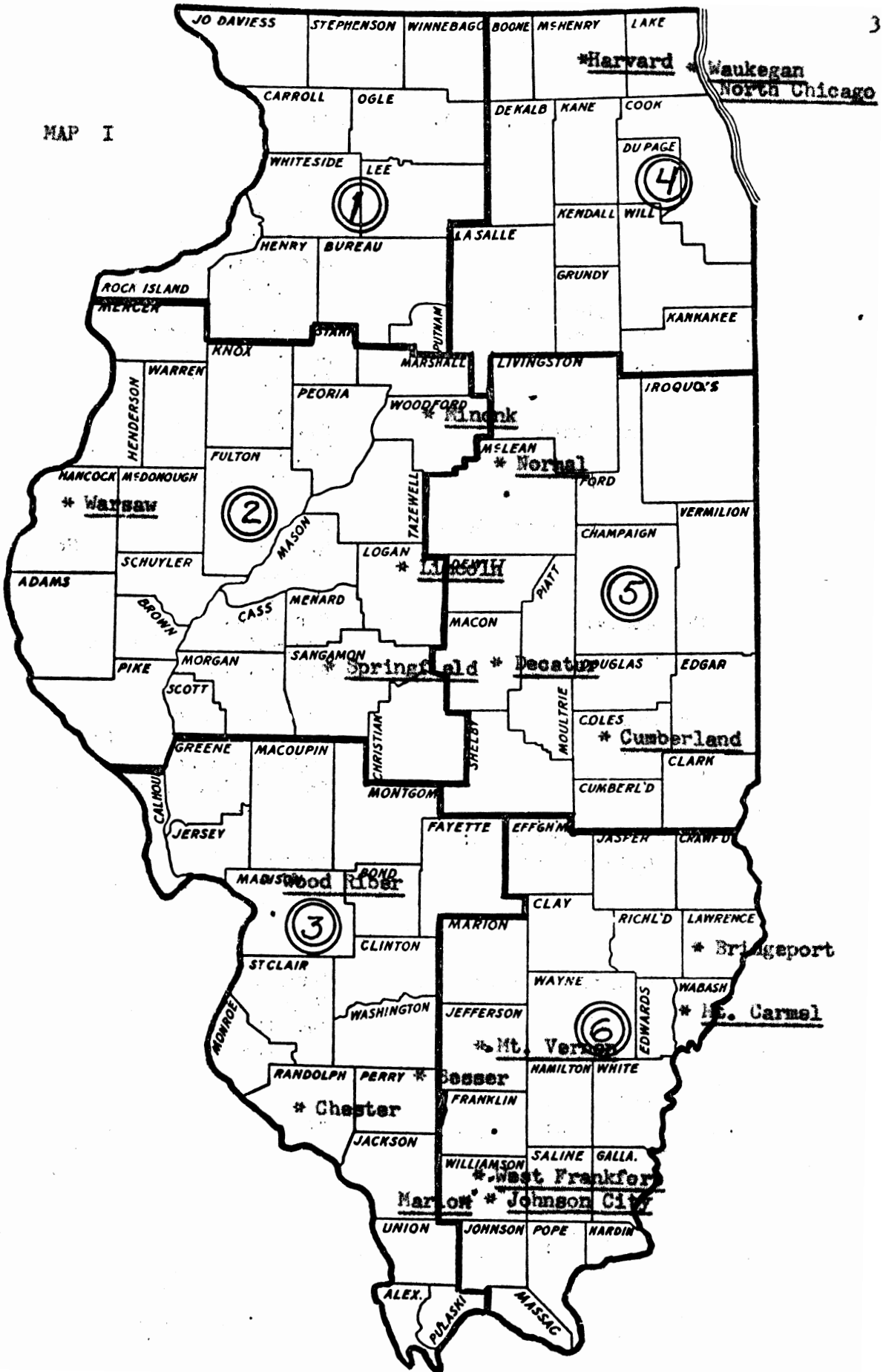
<sup>1</sup>E. A. Lair, "The Vocational Building Trades Program in Illinois," Illinois Vocational Progress, Vol. XIX, No. 3, (February, 1962), p. 38.

The state building trades program continued to expand. During the ten year period between 1932 and 1942, thirty-six schools added new programs, while only seven programs were dropped.

During the past twenty-three years changes have occurred in the geographic locations of programs. At present, twenty vocational building trades programs are located in northern, central, and southern Illinois with 80% of the programs in the central and southern areas.

The twenty programs are located at Johnson City, Bridgeport, Champaign, Chester, Cumberland, Decatur, Harvard, Lincoln, Marion, Minonk, Mt. Carmel, Mt. Vernon, Normal, North Chicago, Sesser, Springfield, West Frankfort, Warsaw, Waukegan, and Wood River. (See Map I, page 3.)

MAP I



## STATEMENT OF THE PROBLEM

The purpose of this investigation was to ascertain the status of the building trades program in the state of Illinois by examining the populous and geographic locations of the programs, curriculum offerings in the programs, qualifications of the instructors, and the number of students enrolled in the program of each school.

Most of the programs are located in sparsely populated areas in relation to the rest of the state. Communities supporting building trades programs, as well as programs in the rest of the state, are benefiting from the trained students graduating. Today's population is very mobile for various reasons, but probably the most important reason for moving would be to find employment; therefore, students need a salable skill.

If one area of the state is supplying workmen to other areas, are the curriculums of the existing programs satisfying the need of all the state? Building is similar in all areas of the state, but types of structures vary according to the building needs of the community. New techniques, building materials, and methods are being used in more populous areas, and they are not available to the less heavily populated areas except through the use of movies or other teaching aids. Even if these teaching aids are plentiful and available, existing programs must satisfy the major objective of building trades which is manipulative work.

The manipulative work is taught by an instructor, or with the aid of a craftsman skilled in the area of the work being done. Most instructors are journeymen in one of the areas of the building trades. The instructors have to draw upon past experience or the aid of an outside craftsman in an area of building trades in which he is not experienced. Perhaps closer cooperation of trades unions would result in more comprehensive training for the boys in building trades programs and better placement of the boys upon graduation.

The boys who graduate from building trades programs are a small percentage of the total school population. Only about 45% of those electing building trades go into the building trades according to the last state study as of 1961.<sup>2</sup> The U. S. Bureau of Labor states that in 1958-59 fewer apprentices were trained for the building trades than the number of journeymen who dropped out.

In 1959, of all the registered apprentices in Illinois, 71%, or 3,773, were in building trades.<sup>3</sup>

The question can be asked if enough students are being trained in existing building trades programs?

Statistics show that we have at present:<sup>4</sup>

1. Enrolled in building trades classes . . . 368
2. Percentage of placement at graduation . . . 45%

<sup>2</sup>E. A. Lair, Selling the Building Trades Program, I. V. A. Convention Bulletin, Building Trades Section, March, 1961.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.

## DELIMITATIONS

The study includes only vocational building trades programs in the secondary schools in the state of Illinois.

The investigation covers only communities where building trades is offered.

The study deals with the size of the schools which offered building trades programs, and the number of students taking the program. Selection of students was not a factor considered in listing class size.

The instructors qualifications to teach building trades were considered without a breakdown of years of experience in each area of building trades; however, experience in one area in which he holds a union card was a factor. Willingness of the local trades to cooperate was not considered, nor were needs of the community studied.

Recommendations were of a general nature because of the diversity of the existing programs and the various purposes for which these recommendations might be used.

## SIGNIFICANCE OF THE STUDY

The Illinois Department of Labor predicts during the 60's increases of 24% in the skilled crafts trades; 22% in proprietors and managers; 22% in semi-skilled operators; and 13% in service workers.<sup>5</sup>

At present there are not enough people being trained to fill the replacements needed by those craftsmen who are retiring or dying.

There will be more people in the 60's with a high school education than ever before. Yet, during the 60's, 30% of all the youths applying for work will not have a high school education. Young people will have to account for nearly one-half of the labor force growth needed during this decade.

Members of organized labor are realizing more and more that there is an increasing need to do everything possible to further train and educate all workers in order that they might hold jurisdiction of their jobs. There are rapid changes being made every day in production methods as well as products manufactured. One-fourth of all products in use today were unheard of five years ago.

The federal government is encouraging, through the vocational act of 1963, antipoverty legislation, and manpower programs, and through the establishment of vocational trades programs. Among these programs being established are programs in the building trades.

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<sup>5</sup>State of Illinois, State Board of Vocational Education and Rehabilitation, Springfield, Illinois, 1963-1964.



It is the author's belief that existing programs can be up-graded, and new building trades programs can be opened in areas of the state where the need is indicated.

## BACKGROUND OF THE STUDY

This section presents a background of information essential to an understanding and effective appraisal of the material present in this study.

The area dealt with was the communities in the state which support vocation building trades. (See Map II, page 10.)

In 1960, the population of Illinois was 10,081,158 of which Chicago contains 3,550,404, and Cook County has a population of 5,127,158.<sup>6</sup> Three other areas contain 200,000 or more people, and five more areas contain 100,000 people to 200,000 people. Only six other communities contain 50,000 people or more. (See Illinois Map II, page 10 for the populated areas of the state of Illinois.)

There are 82,537 apprentices in the various trades in the United States as of 1960.<sup>7</sup> In the state of Illinois, 8,773 apprentices were registered and 71% of the Illinois apprentices were in building trades occupations.<sup>8</sup> Statistics show that there were 360 boys enrolled in building trades in 1961.<sup>9</sup>

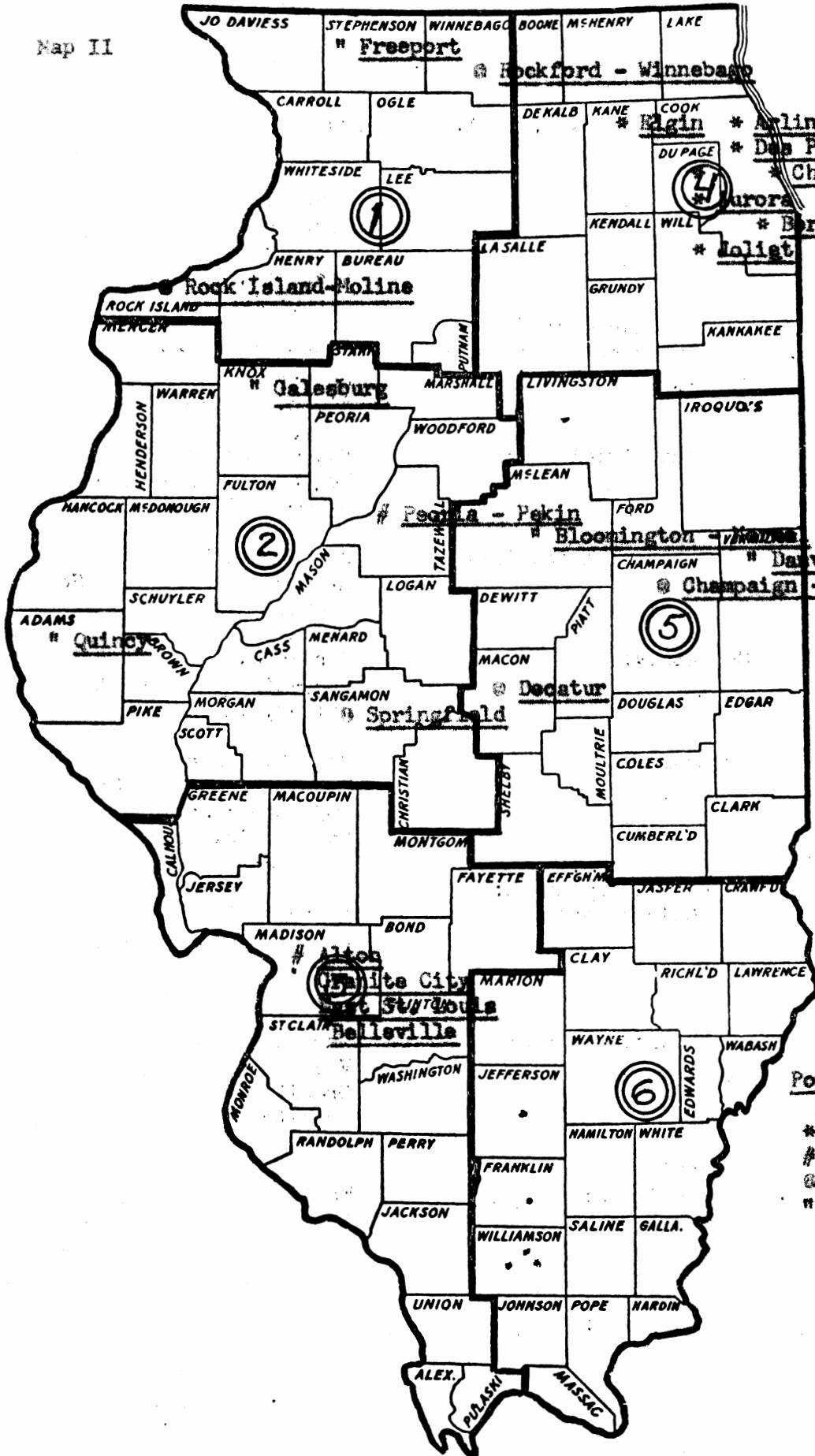
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<sup>6</sup>Harry Hansen, editor, World Almanac and Book of Facts for 1964, New York World Telegram & Sun, New York, 1964., pp. 251; 258.

<sup>7</sup>U. S. Bureau of the Census, Characteristics of the Population, Volume 1, Part 15, pp. 1-530.

<sup>8</sup>State Board of Vocational Education and Rehabilitation, Trade and Industrial Education, Bulletin, 1963-64.

<sup>9</sup>Ibid.



Population Symbols

- \* 250,000 plus
- # 200,000 plus
- ⊙ 100,000 plus
- ⊞ 25,000 - 50,000

Building trades craftsmen make up the largest group of skilled workers in the nation's labor force. Among this group are metal workers, electricians, masonry workers, plumbers, heating workers, painters, excavating workers, plasterers, and carpenters. Altogether, there were three million such craftsmen in mid-1960, almost a third of all the skilled workers.

The definitions of an expert craftsman are many and varied, but an expert craftsman must have full knowledge of the technical problems as well as the manipulative skills. In the building trades industry the worker must be prepared for almost any job experience within the limits of his craft. Because of the wide variations possible the building trades craftsman must be prepared to do work of varying degrees of skill.

The technical related knowledge of his trade that building trades workers need are: trade terminology covering commonly used terms and expressions; blueprint reading covering specific information; drawing and shop sketching covering construction methods, layout methods and geometrical construction; layout problems as applied to layout materials; care of tools, equipment, and material; knowledge of materials including items as kinds, grades, sizes, uses, purchasing units; and safety practices in occupational hazards, care in handling and placing tools, and proper craft clothing.

The building trades worker must also maintain good human relations between employer-employee, understand labor laws, personality factors between workmen, and other similar relationships.

Most important of all the building trades worker must have a thorough knowledge of his specific area of work.

For a background of this study, the reader needs to understand the relationship of a teacher and his pupils in a building trades program, problems confronting the instructor which are not apparent in typical teaching situations, and some knowledge of the areas of building trades. The major difference between the preparation of a classroom teacher and the building trades teacher is the work background required of the building trades teacher.

#### METHOD AND SURVEY OF RESEARCH

All building trades instructors in the state of Illinois were contacted and asked to fill out a questionnaire. The questionnaire was to obtain information about curriculum offerings in their programs, their formal educational preparation, including work background, and the size of school and building trades class size.

Research was done in various libraries throughout the state for the remaining information included in this study. The State Department of Vocational Education facilities were of utmost importance in obtaining information.

## FINDINGS

The data presented in this section provides specific information regarding the status of building trades programs in the state of Illinois. The information was obtained through an inquiry form. Responses were obtained from seventeen of the twenty building trades programs in existence. The responses were organized and treated as the findings of the investigation.

This section also provides information concerning the opinions of instructors as to the feasibility of accepting financial and instructional aid from local unions.

The data have been presented under the following major headings: populous areas and geographic locations of the programs; qualifications of the instructors; curriculum offered in the programs; and the number of students enrolled in the programs of each school, and size of school.

### Populous and Geographic Locations of the Programs.

By scaling the map of Illinois on page 3, and dividing the result by three, the state of Illinois has been separated into three equal vertical sections.

Four building trades programs are located in the northern third of the state. The programs are located at Harvard, Waukegan, North Chicago, and Minonk.

Most of the populous areas are located in the northern third of the state. The areas include Chicago, Elgin, Arlington Heights,

Des Plaines, Berwyn, Park Ridge, Aurora, Joliet, and Park Forest, each having 250,000 or more people. Rockford-Winnebago and Rock Island-Moline area have 100,000 or more people located in their boundaries. Freeport and Kankakee areas contain 25,000 to 50,000 people each.

Cook County has over one-half of the total population of Illinois.

Eight building trades programs are located in the central third of the state. They are Warsaw, Normal, Lincoln, Champaign, Springfield, Decatur, Cumberland, and Wood River.

Springfield, Decatur, and Champaign-Urbana areas have 100,000 or more people. Peoria-Pekin have 200,000 or more people located within their area. Bloomington-Normal, Danville, and Quincy have 25,000 to 50,000 people located within their boundaries.

Wood River is located just north of an area which contains 200,000 or more people.

The southern third of the state has eight building trades programs located at Bridgeport, Mt. Carmel, Mt. Vernon, Sesser, Chester, West Frankfort, Johnson City, and Marion. This area has one populous region and that is the Alton, Granite City, East St. Louis, and Belleville area. This area has a population of 200,000 people or more. See Map I, page 3, for the locations of the programs in reference to their location in the state of Illinois. Map II, page 10, lists the populous areas of the state of Illinois.

## QUALIFICATIONS OF THE INSTRUCTORS

In evaluating the qualifications of the teachers, it is assumed that all teachers are qualified to teach school in the state of Illinois. Formal education, a journeyman's card, number of years they have held union cards, and outside help received in building project homes were listed in the survey.

Three teachers have no degree. Seven teachers have bachelor degrees, and seven teachers hold masters degrees. (See Table I, page 16.)

Five teachers do not have a journeyman's card in any trade. Twelve teachers hold journeymen cards in carpentry. One teacher has held his card one year, one for 6 years, two for 7 years, and one for 10 years, one for 12 years, one for 14 years, two for 20 years, one for 17 years, one for 26 years, and one instructor has held his card for 48 years. (See Table II, page 17.)

All building trades instructors receive some type of outside help in construction of the houses built in the program.

No outside help is required in the area of carpentry and painting; while all instructors receive some form of outside aid in all other areas of the building trades. (See Table III, page 18, for areas in which instructors receive outside help.)



TABLE I: FORMAL EDUCATION OF BUILDING TRADES INSTRUCTORS

Number of instructors answering questionnaire	Formal education		
	No Degree	Bachelor Degree	Masters Degree
8	*	*	*
7	*	X	X
6	*	*	*
5	*	*	*
4	*	*	*
3	X	*	*
2	*	*	*
1	*	*	*
0	*	*	*

NOTE: The figure X represents the number of instructors holding the degree marked in the column to the left of the X.

TABLE II: NUMBER OF INSTRUCTORS HOLDING UNION CARDS  
AND TIME HELD CARD

Number of instructors holding union cards						Length of time instructors have held union cards
5	4	3	2	1	0	
*	X	*	*	*	*	0 years
*	*	*	*	X	*	0 - 5 years
*	*	X	*	*	*	5 - 10 years
*	*	X	*	*	*	10 - 15 years
*	*	X	*	*	*	15 - 20 years
*	*	*	*	*	X	20 - 25 years
*	*	*	X	*	*	25 - 50 years

NOTE: The figure X represents the number of instructors and the number of years they have held union cards.

TABLE III: AREAS IN WHICH BUILDING TRADES TEACHERS RECEIVE  
OUTSIDE HELP

Areas of the building trades in which teachers receive outside help	Number of teachers who receive outside help													
	12	11	10	9	8	7	6	5	4	3	2	1	0	
Carpentry	*	*	*	*	*	*	*	*	*	*	*	*	*	X
Plastering	*	*	*	*	*	*	X	*	*	*	*	*	*	*
Excavating	X	*	*	*	*	*	*	*	*	*	*	*	*	*
Painting	*	*	*	*	*	*	*	*	*	*	*	*	*	X
Heating	*	X	*	*	*	*	*	*	*	*	*	*	*	*
Plumbing	*	X	*	*	*	*	*	*	*	*	*	*	*	*
Masonry	*	*	*	*	X	*	*	*	*	*	*	*	*	*
Electrical wiring	*	*	*	*	*	*	*	X	*	*	*	*	*	*
Metal-work	*	*	*	*	*	*	X	*	*	*	*	*	*	*

NOTE: The figure X represents the number of instructors who receive  
outside help.

## CURRICULUM OFFERED IN THE PROGRAMS

There are nine areas in building trades consisting of carpentry, plastering, excavating, painting, heating, plumbing, masonry, electrical wiring, and metal work.

Each of these areas has been broken down into eight categories covering each area. These categories are: trade terminology; blueprint reading; drawing and shop sketching; layout problems; trade mathematics; care of tools, equipment, and materials; knowledge of materials; and safety practices.

In the building trades area of carpentry, 17 instructors teach trade terminology, 16 teach blueprint reading, 17 teach drawing and shop sketching, 17 teach layout problems, 17 teach trade mathematics, 17 teach care of tools, equipment, and materials, 17 teach knowledge of materials, and 17 teach safety practices. (See Table IV, page 20.)

In the area of plastering, 7 instructors teach trade terminology, 1 teaches blueprint reading, none teach drawing and shop sketching, 1 teaches layout problems, 1 teaches trade mathematics, 1 teaches care of tools, equipment, and material, 3 teach knowledges of materials, and 2 teach safety practices. (See Table V, page 21.)

In the building trades area of excavating, 10 instructors teach trade terminology, 8 teach blueprint reading, 3 teach drawing and shop sketching, 3 teach layout problems, 4 teach trade mathematics, 8 teach care of tools, equipment, and materials, 5 teach knowledge of materials, and 7 teach safety practices. (See Table VI, page 22.)

TABLE IV: CURRICULUM TAUGHT IN THE AREA OF CARPENTRY

Specific material taught in the area of carpentry	Number of Instructors					
	12	13	14	15	16	17
Trade terminology	*	*	*	*	*	X
Blueprint reading	*	*	*	*	X	*
Drawing and shop sketching	*	*	*	X	*	*
Layout problems	*	*	*	*	*	X
Trade mathematics	*	*	*	*	*	X
Care of tools, equipment and material	*	*	*	*	*	X
Knowledge of materials	*	*	*	*	*	X
Safety practices	*	*	*	*	*	X

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

TABLE V: CURRICULUM TAUGHT IN THE AREA OF PLASTERING

Specific material taught in the area of plastering	Number of Instructors									
	0	1	2	3	4	5	6	7	8	
Trade terminology	*	*	*	*	*	*	*	X	*	
Blueprint reading	*	X	*	*	*	*	*	*	*	
Drawing and shop sketching	X	*	*	*	*	*	*	*	*	
Layout problems	*	X	*	*	*	*	*	*	*	
Trade mathematics	*	X	*	*	*	*	*	*	*	
Care of tools, equipment and material	*	X	*	*	*	*	*	*	*	
Knowledge of materials	*	*	*	*	X	*	*	*	*	
Safety practices	*	*	X	*	*	*	*	*	*	

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

TABLE VI: CURRICULUM TAUGHT IN THE AREA OF EXCAVATING

Specific material taught in the area of excavating	Number of Instructors								
	3	4	5	6	7	8	9	10	
Trade terminology	*	*	*	*	*	*	*	*	X
Blusprint reading	*	*	*	*	*	X	*	*	
Drawing and shop sketching	X	*	*	*	*	*	*	*	
Layout problems	X	*	*	*	*	*	*	*	
Trade mathematics	*	X	*	*	*	*	*	*	
Care of tools, equipment and materials*	*	*	*	*	*	X	*	*	
Safety practices	*	*	*	*	X	*	*	*	
Knowledge of materials	*	*	X	*	*	*	*	*	

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

In the building trades area of painting, 15 instructors teach trade terminology, 6 teach blueprint reading, 3 teach drawing and shop sketching, 5 teach layout problems, 7 teach trade mathematics, 16 teach care of tools, equipment and material, 12 teach knowledge of materials, and 16 teach safety practices. (See Table VII, page 24.)

In the building trades area of heating, 12 instructors teach trade terminology, 11 teach blueprint reading, 5 teach drawing and shop sketching, 6 teach layout problems, 4 teach trade mathematics, 7 teach care of tools, equipment, and materials, 8 teach knowledge of materials, and 9 teach safety practices. (See Table VIII, page 25.)

In the building trades area of plumbing, 11 instructors teach trade terminology, 9 teach blueprint reading, 5 teach drawing and shop sketching, 8 teach layout problems, 6 teach trade mathematics, 9 teach care of tools, equipment, and materials, 10 teach knowledge of materials, and 10 teach safety practices. (See Table IX, page 26.)

In the building trades area of masonry, 12 instructors teach trade terminology of the area, 12 teach blueprint reading, 6 teach drawing and shop sketching, 5 teach layout problems, 6 teach trade mathematics, 12 teach care of tools, equipment, and materials, 9 teach knowledge of materials, and 11 teach safety practices of the area. (See Table X, page 27.)

In the building trades area of electrical wiring, 13 instructors teach trade terminology of the trade, 13 teach blueprint reading, 6 teach drawing and shop sketching, 5 teach layout problems, 6 teach trade mathematics, 11 teach care of tools equipment, and materials, 13 teach knowledge of materials, and 15 teach safety practices. (See Table XI, page 28.)



TABLE VII: CURRICULUM TAUGHT IN THE AREA OF PAINTING

Specific material taught in the area of painting	Number of Instructors															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Trade terminology	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	*
Blueprint reading	*	*	*	*	*	X	*	*	*	*	*	*	*	*	*	*
Drawing and shop sketching	*	*	X	*	*	*	*	*	*	*	*	*	*	*	*	*
Layout problems	*	*	*	*	X	*	*	*	*	*	*	*	*	*	*	*
Trade mathematics	*	*	*	*	*	*	X	*	*	*	*	*	*	*	*	*
Care of tools, equipment and material	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X
Knowledge of materials	*	*	*	*	*	*	*	*	*	*	*	X	*	*	*	*
Safety practices	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

TABLE VIII: CURRICULUM TAUGHT IN THE AREA OF HEATING

Specific material taught in the area of heating	Number of Instructors									
	4	5	6	7	8	9	10	11	12	
Trade terminology	*	*	*	*	*	*	*	*	X	
Blueprint reading	*	*	*	*	*	*	*	X	*	
Drawing and shop sketching	*	X	*	*	*	*	*	*	*	
Layout problems	*	*	X	*	*	*	*	*	*	
Trade mathematics	X	*	*	*	*	*	*	*	*	
Care of tools, equipment and material	*	*	*	X	*	*	*	*	*	
Knowledge of materials	*	*	*	*	X	*	*	*	*	
Safety practices	*	*	*	*	*	X	*	*	*	

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

TABLE IX: CURRICULUM TAUGHT IN THE AREA OF PLUMBING

Specific material taught in the area of plumbing	Number of Instructors								
	5	6	7	8	9	10	11	12	
Trade terminology	*	*	*	*	*	*	X	*	
Blueprint reading	*	*	*	*	X	*	*	*	
Drawing and shop sketching	X	*	*	*	*	*	*	*	
Layout problems	*	*	*	X	*	*	*	*	
Trade mathematics	*	X	*	*	*	*	*	*	
Care of tools, equipment and materials	*	*	*	*	X	*	*	*	
Safety practices	*	*	*	*	*	X	*	*	
Knowledge of materials	*	*	*	*	*	X	*	*	

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

TABLE X: CURRICULUM TAUGHT IN THE AREA OF MASONRY

Specific material taught in the area of masonry	Number of Instructors								
	5	6	7	8	9	10	11	12	
Trade terminology	*	*	*	*	*	*	*	X	
Blueprint reading	*	*	*	*	*	*	*	X	
Drawing and shop sketching	*	X	*	*	*	*	*	*	
Layout problems	X	*	*	*	*	*	*	*	
Trade mathematics	*	X	*	*	*	*	*	*	
Care of tools, equipment and material	*	*	*	*	*	*	*	X	
Knowledge of materials	*	*	*	*	X	*	*	*	
Safety practices	*	*	*	*	*	*	X	*	

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

TABLE XI: CURRICULUM TAUGHT IN THE AREA OF ELECTRICAL WIRING

Specific material taught in the area of wiring	Number of Instructors										
	5	6	7	8	9	10	11	12	13	14	15
Trade terminology	*	*	*	*	*	*	*	*	X	*	*
Blueprint reading	*	*	*	*	*	*	*	*	X	*	*
Drawing and shop sketching	*	X	*	*	*	*	*	*	*	*	*
Layout problems	X	*	*	*	*	*	*	*	*	*	*
Trade mathematics	*	X	*	*	*	*	*	*	*	*	*
Care of tools, equipment and material	*	*	*	*	*	*	X	*	*	*	*
Knowledge of materials	*	*	*	*	*	*	*	*	X	*	*
Safety practices	*	*	*	*	*	*	*	*	*	*	X

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

In the building trades area of metal work, 8 instructors teach trade terminology, 7 teach blueprint reading, 4 teach drawing and shop sketching, 5 teach layout problems, 3 teach trade mathematics, 6 teach care of tools, equipment, and materials, 7 teach knowledge of materials, and 8 teach safety practices. (See Table XII, page 30.)

TABLE XII: CURRICULUM TAUGHT IN THE AREA OF METAL WORK

Specific material taught in the area of metal work	Number of Instructors					
	3	4	5	6	7	8
Trade terminology	*	*	*	*	*	X
Blueprint reading	*	*	*	*	X	*
Drawing and shop sketching	*	X	*	*	*	*
Layout problems	*	*	X	*	*	*
Trade mathematics	X	*	*	*	*	*
Care of tools, equipment and material	*	*	*	X	*	*
Knowledge of materials	*	*	*	*	X	*
Safety practices	*	*	*	*	*	X

NOTE: The figure X represents the number of instructors who teach the specific material listed to the left of the X.

## NUMBER OF STUDENTS AND SIZE OF SCHOOLS

School populations varied greatly throughout the state as well as number of students enrolled in each program.

By taking the schools in chronological order of size, school enrollments were 250 students, 300 students, 400 students, 450 students, 500 students, 520 students, 750 students, 760 students, 850 students, 1050 students, 1100 students, 1300 students, 1750 students, 2200 students, 2300 students, 3800 students, and 5200 students. (See Table XIII, page 32.)

The number of students does not necessarily increase in proportion to the size of the school enrollment.

Size of classes taken in order of the smallest class to the largest class were 10 pupils, 11 pupils, 12 pupils, 12 pupils, 12 pupils, 13 pupils, 13 pupils, 13 pupils, 13 pupils, 14 pupils, 15 pupils, 15 pupils, 16 pupils, 17 pupils, 28 pupils, and 30 pupils in the programs. The programs which had 28 and 30 pupils in their classes have an all-day program with one group of students meeting in the morning and the other group meeting in the afternoon session. (See Table XIV, page 33.)



TABLE XIII: SIZE OF SCHOOLS SUPPORTING  
BUILDING TRADES PROGRAMS

Size of schools (Enrollment)	Number of schools supporting building trades programs			
	1	2	3	4
250 - 300	*	X	*	*
400 - 500	*	*	X	*
500 - 600	X	*	*	*
700 - 800	*	X	*	*
850 - 1100	*	*	X	*
1300 - 1800	*	X	*	*
2200 - 2300	*	X	*	*
3800 - 5200	*	X	*	*

NOTE: The figure X represents the number of schools supporting a building trades program and having an enrollment listed to the left of the X.

TABLE XIV: CLASS SIZES OF BUILDING TRADES PROGRAMS

Size of class (Enrollment)	Number of Schools				
	1	2	3	4	5
10	X	*	*	*	*
11	X	*	*	*	*
12	*	*	X	*	*
13	*	*	*	X	*
14	X	*	*	*	*
15	*	X	*	*	*
16	X	*	*	*	*
17	X	*	*	*	*
28	X	*	*	*	*
30	X	*	*	*	*

NOTE: The figure X represents the number of schools having the enrollment of the class size listed to the left of the X in each column.

## SUMMARY

Building trades provides an unusual opportunity for offering vocational training in trade and industrial occupations.

It is one of several day trade preparatory programs known as Type B, or pre-employment classes for students who have not entered upon employment and who are regularly enrolled in a full time day school.

Classes are scheduled for three consecutive clock hours per day, five days per week, thirty-six weeks per year, including related instruction as an integral part of the shop or laboratory, rather than separate units of instruction.

In cases where two classes are being offered per day, it is permissible for them to meet for a minimum of two consecutive hours per day, five days per week.

At least one-half of the time of instruction must be given to work on a useful or productive basis. Instruction in practical work is considered to be on a useful or productive basis when it consists of organized, systematic training in the processes, operation, and principles involved, which are selected with regard to the suitability, quality, quantity, and production methods customarily observed in trade, industrial and technical occupations for which the training is being given. The related instruction is given as an integral part of the work at the time it is needed rather than as separate units.

The building of the house is not an objective of the program but is merely a vehicle of instruction for teaching both skills and the related information. It should prepare the student for advantageous entrance into the building trades.

There are many advantages and opportunities for students as a result of building trades. The specific objectives are:<sup>10</sup>

1. To orient students in the basic building trades.
2. To develop skills and knowledge by practical construction.
3. To develop appropriate and safe work habits.
4. To develop wholesome understandings of trade and social problems.
5. To develop the ability to apply technical and related information to the construction trades.
6. To develop desirable attitudes of initiative, responsibility and resourcefulness in the student.
7. To develop a pride in accomplishment and good workmanship.

Standards for the program are:<sup>11</sup>

1. Students shall be at least 16 years of age and have junior standing in high school.
2. Students shall enroll with the intention of completing two years of training in the building trades program.
3. Students shall enroll with the intention of entering the trade.
4. It is recommended that all enrollees in the building trades program have at least one year of previous industrial arts training.
5. A building project consisting of a two- or three-bedroom house should be constructed as a vehicle for instruction.

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<sup>10</sup>State of Illinois, State Board of Vocational Education, Series A-Bulletin No. 115, Revised, January, 1959

<sup>11</sup>Ibid.

6. With a one-half day program, it is recommended that two years be spent in constructing the house project. A two-year program provides ample time for sufficient classroom study in the related and technical information area.
7. The size of the classes should be limited to 20 students.

Students for these classes should be selected. Students may enroll in the building trades classes provided:<sup>12</sup>

1. They are 16 years of age or older.
2. They have an aptitude for the type of work done in the building trades.
3. They have good attendance records.
4. They are physically fit to take a job.
5. They are interested in receiving occupational training.
6. They will pursue this training for a period of two school years.
7. They have good character and personality.

The building trades programs are not intended to serve all youth of any given community. They are intended to serve most effectively those students who plan to enter any of the areas of work common to the building trades industry. They are generally known as:

1. Carpentry
2. Painting
3. Masonry
4. Sheetmetal
5. Plumbing and air conditioning
6. Electrical wiring
7. Heating
8. Excavating

Classes meet in the shop at the beginning session where classroom work, lectures, demonstrations, and related work is given. Then the boys do the manipulative work at the building site.

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<sup>12</sup>Ibid.

Building Trades Programs. Twenty programs exist throughout the state of Illinois today. New programs open frequently throughout the state while older programs fold and close. The number of programs in operation from year to year remains about the same.

The population of the areas which supports a building trades program ranges from a low of 1500 population to a high of 83,271. Three programs or 15% of the programs are supported by an area which has a population under 2,000 people. Three programs or 15% are supported by an area which has a population between 2,000 and 4,000 people. Four programs or 20% are supported by an area which has a population between 4,500 to 11,200 people. Four programs or 20% are supported by an area which has a population between 15,000 and 23,000 people. Four programs or 20% are supported by an area which has a population between 50,000 and 83,000. (See Table XV, page 38.)

Four programs or 20% are located in the northern third of the state and the population well exceeds 50% of the total population of the state. Considering only the populous areas of the state, the northern one-third of the state contains 14 or 66% of the populous areas.

Eight programs or 40% of the entire programs are located in the central one-third of the state; while seven or 33% of the populous areas are located in this area.

The southern one-third of the state has 8 or 40% of the programs supported by the state. Only one or 1% of the populous areas are located in the southern third of the state.

TABLE IV: SIZE OF COMMUNITIES SUPPORTING  
BUILDING TRADES PROGRAMS

Size of community (Population)	Number of communities			
	1	2	3	4
1,500 - 2,000	*	*	X	*
2,000 - 3,000	*	X	*	*
3,000 - 4,000	X	*	*	*
4,000 - 5,000	*	X	*	*
8,000 - 9,000	X	*	*	*
9,000 - 10,000	X	*	*	*
11,000 - 12,000	*	X	*	*
15,000 - 16,000	X	*	*	*
16,000 - 17,000	X	*	*	*
17,000 - 18,000	X	*	*	*
22,000 - 23,000	X	*	*	*
49,000 - 50,000	X	*	*	*
55,000 - 56,000	X	*	*	*
78,000 - 79,000	X	*	*	*
83,000 - 84,000	X	*	*	*

NOTE: The figure X represents the number of communities with a population represented to the left of the X in each column.

Qualifications of the Instructors. Seventeen of the twenty instructors answered and returned questionnaires. Three or 15% of the instructors have no degree. These three teachers have 75 years of work experience in the building trades among them.

Seven teachers or 41% of the instructors have bachelor degrees. Three teachers do not hold journeyman cards in any of the areas of building trades; however, they have indicated work experiences in various fields of the building trades. The four teachers who hold journeyman cards have an accumulation of 47 years of experience in the areas of building trades.

Seven teachers or 41% of the instructors have masters degrees. Two of these seven instructors do not hold journeyman's cards. The remaining five instructors have an accumulation of 66 years of experience among them in the building trades areas.

Seventeen or 100% of the instructors receive no outside help in the carpentry field of the building trades areas. Of those instructors who use plastering in building their projects, six instructors receive outside help. Twelve or 70% of the instructors receive outside help in excavating. Seventeen or 100% of the instructors receive no outside help in painting. Eleven or 65% receive outside help in heating. Eleven or 65% receive outside help in plumbing. Eight or 47% receive outside help in masonry. Five or 29% receive outside help in wiring. Six or 35% receive outside help in metal work.

Enrollment of Schools and Number of Students in Class. Seventeen sent replies; the questionnaire results were calculated from these



schools. Two schools or 11% of the schools supporting programs have 300 or less students in school. The average of students enrolled in building trades is 11½ students. Four or 23% of the schools have an enrollment of 400 to 550 pupils and an average class size of building trades pupils of 14. Four or 23% of the schools have a student body of 750 to 1050, and an average building trades class of 13 students. Three or 17% of the schools have a student body of 1000 to 1,750 students, and an average building trades class of 12 students. Four or 23% of the schools have a student body enrollment of 2,200 to 5,200 students, and an average class size of 15 students.

Curriculum. No curriculum is laid out or planned by the federal government which states or local instructors must follow. The state has a guide that can aid the instructor in teaching the various areas of the building trades. Instructors are given a large amount of freedom in which they can select material and method of presentation to their classes.

All instructors spend an average of 65% of their time teaching the trade terminology, blueprint reading, drawing and shop sketching, layout problems, trade mathematics, care of tools, equipment, and material, knowledge of materials and safety practices of the carpentry field of the building trades area.

The instructors who teach plastering spend 3% of the time in teaching plastering. No time is spent by instructors in teaching students the layout of plaster. Seven of the instructors teach trade terminology, and three teach knowledge of materials. Seven instructors teach about plastering.

Instructors who teach excavating spend 4% of the time in the teaching of excavating. Ten instructors teach excavating.

Of the instructors who teach painting 11% of the time is spent in teaching painting. Fifteen instructors teach painting.

Those instructors who teach plumbing spend 7% of the time in teaching plumbing. Eleven instructors teach some parts of plumbing.

Masonry is taught 6% of the time by those instructors who teach masonry. Twelve instructors teach some facets of masonry.

Instructors who teach wiring spend 7% of the time in the teaching of wiring. Thirteen instructors teach some facets of wiring.

In the teaching of heating, those instructors who teach heating spend 4% of the time teaching heating. Twelve instructors teach some facets of heating.

In the area of metal work, those instructors who teach metal work spend 2% of the time in that area. Eight instructors teach some facets of metal work.

## CONCLUSIONS

Vocational building trades classes are made up of high school students fortunate enough to enjoy the benefits of theory and practice in the construction trades.

Existing programs have shown that high school students, under proper supervision, are capable of building a salable house during the school year. All the instructors answering the questionnaire stated that the cost of constructing a full size building was not an inhibiting factor.

The students and community both benefit when students obtain a knowledge of a trade which otherwise may have been impossible to obtain. It is evident that existing programs are not located in the most populous areas of the state, but statistics show the need for more trained craftsmen throughout the state. The programs are so located that the local community and surrounding areas could support the number of students graduating and entering into the building trades field from building trades programs.

With the exception of one program in the central part of the state, the programs are located in populous areas where students should be able to gain employment. All programs in the northern part of the state are located in or near populous areas. In the southern third of the state the programs on a whole are located in communities of 10,000 population or more. Three programs are located in smaller

communities, but they are near areas of population which could support them. In conclusion, the population of an area does not directly affect a program staying in operation or closing.

The point of populous and geographic locations could be summarized by saying there is a greater demand for building trades workmen than what is being supplied by building trades programs.

Curriculum being offered and taught is basically the same in all parts of the state. All instructors are doing excellent teaching of carpentry and painting in that they do not receive outside help. Further study could have been made into why instructors were getting help in certain areas of the building trades. If percentage of time spent in areas were taken into consideration, then instructors are spending 75% of their teaching with no outside help. Building trades are serving the needs of students in carpentry and painting. On an average 65% of the time is spent in carpentry and all instructors are qualified to teach the area of carpentry.

Plumbing, masonry, and excavating are the areas where most of the instructors receive outside aid. All instructors spend an average of 17% of their time in these areas of teaching. Many factors could be considered why outside help was needed in these areas from cost of buying equipment, to storage of equipment, and order of difficulty of teaching these areas.

Of the 8% of the time left in teaching the remaining areas of building trades, none receive over 3% of the teaching time. (See Table XVII, page 44, for percent of time spent in each area.)

TABLE XVI: PERCENT OF TIME SPENT IN EACH AREA

Areas of building trades	Number of Instructors teaching area	Percent of time spent in area
Carpentry	13	65%
Plastering	5	1%
Excavating	8	3%
Painting	12	10%
Plumbing	9	5%
Masonry	10	5%
Electrical Wiring	10	6½%
Heating	9	4%
Metal Work	6	1½%

NOTE: The percentages are rounded off to the nearest full percent number. All instructors did not return a percent of time spent in each area.

The formal education of all instructors is high with the exception of three instructors. Two of these instructors have been teaching building trades a number of years and have held carpenters' cards for 18 and 20 years respectively. The remaining instructor who does not have a degree has seven year's experience in the carpentry field.

Only four teachers indicated they did not hold a journeyman's card. Two of these instructors have masters degrees and the two remaining have bachelor degrees. All four have been teaching building trades for several years and have indicated a number of years in the carpentry trade in a non-union capacity.

Instructors from all parts of the state receive approximately the same amount and same type of outside help and in the same areas.

With the exception of one school, all schools are of large enough enrollment to support building trades programs; however, the number of students in most programs is below the average of what is recommended by the state. Size of the school has no relation to size of building trades class. Some of the larger schools have smaller classes. All programs combined average  $13\frac{1}{2}$  students in each program, and the state recommends between 16 and 20 students.

The weather in one geographic location of the state is not more advantageous than in another part of the state in playing a role in the success of the building trades programs.

## RECOMMENDATIONS

1. Closer ties with local labor unions, especially in supplementary instruction and aiding in placement of building trades students.
2. A need for more research in the building trades program, especially in these capacities:
  - A. Recommend a study be made of the more populous areas and determine if there is a need for building trades programs in these areas.
  - B. Recommend a study to determine type of project house being constructed and if it fits the needs of the community.
  - C. Recommend a study to determine exactly what should be taught in the curriculum of the building trades programs.
  - D. Recommend a study to determine how teachers can be better selected and trained in teaching building trades.
3. Recommend a book be published on methods of teaching building trades listing examples from experiences of various building trades instructors.

**APPENDIX**



Dear

Will you contribute ten minutes of your time to help determine the status of building trades in the state of Illinois?

Research in this field, or written material of any nature relating to building trades, is difficult to find. Your participation is very important in the completion of this research. Please fill out and return the questionnaire as soon as possible.

There are only 22 building trades programs throughout the state, and it is important to get 100% return to give a true picture of the status of building trades.

You will find a self-addressed stamped envelope enclosed for your convenience.

Please mark at the end of the questionnaire if you would like to have a copy of the results of this research.

Thank you for your time and consideration.

Sincerely,

Markes F. Ervin, Jr.  
B. T. Instructor  
Normal Community High School

Q\*U\*E\*S\*T\*I\*O\*N\*N\*A\*I\*R\*E

What is the enrollment of your school? \_\_\_\_\_

What is the enrollment of your building trades class(es)? \_\_\_\_\_

What formal educational preparation do you now hold? If non-degree member  
 Bachelor \_\_\_\_\_ Master \_\_\_\_\_ Other \_\_\_\_\_ number of years \_\_\_\_\_

Do you hold a journeyman Card? \_\_\_\_\_ Which trade(s)? \_\_\_\_\_

How long have you held your card(s)? \_\_\_\_\_

Check each area of work in which you receive outside help.

carpentry _____	masonry _____
plastering _____	wiring _____
excavating _____	metal work _____
painting _____	heating _____
plumbing _____	other _____

The statements below are the basic technical content recommended for each area of instruction in a building trades program.

- a. Trade terminology covering commonly used terms and expressions.
- b. Blueprint reading covering specific information.
- c. Drawing and shop sketching covering construction methods, layout methods, and geometrical construction.
- d. Layout problems as applied to building, openings, arches, rafter cutting, and stair building.
- e. Trade mathematics covering quantities of materials, and layout materials.
- f. Care of tools, equipment, and material.
- g. Knowledge of materials including items as kinds, grades, sizes, uses, purchasing units.
- h. Safety practices which should be followed to eliminate scaffold hazards; care in handling and placing tools; proper craft clothing.

Circle the letter or letters before each area if you teach the technical content of the statements covering the area.

Example: a b c d e f g h wiring. I covered the technical content of statements a, b, c, f, g, h in wiring; therefore, I would circle those letters before the area.

b c d e f g h carpentry	a b c d e f g h plumbing
b c d e f g h plastering	a b c d e f g h masonry
b c d e f g h excavating	a b c d e f g h wiring
b c d e f g h painting	a b c d e f g h metal work
b c d e f g h heating	

1. Approximately what percent of time, related and manipulated, do you spend on each area of work?

carpentry _____%	painting _____%	masonry _____%	metal work _____%
plastering _____%	plumbing _____%	wiring _____%	heating _____%
excavating _____%	other _____%		

2. What percentage of the graduating students find employment in one of the areas of building trades in your locality? \_\_\_\_\_%
3. What percentage of the students are finding employment in the building trades outside of your locality? \_\_\_\_\_%

The following questions are opinion questions and are to be used for recommendations only:

1. Are labor unions in your area in favor of the building trades program in high school? \_\_\_\_\_
2. Should more cooperation exist between your program and labor unions for better placement and aid in instruction of your students? \_\_\_\_\_
3. Is the cost of constructing a full sized building an inhibiting factor? \_\_\_\_\_
-

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March 21, 1966

Dear Mr.

Recently you received a questionnaire from me. As of this date I have not received the completed questionnaire. To make this study valid I must have as much information as possible.

Only five members have failed to complete and return this questionnaire.

If you have lost or misplaced the questionnaire, please contact me, and I will send you another.

If your completed questionnaire is in the mail, please disregard this card. Thank you for your time and trouble.

Sincerely,

Markas F. Ervin, Jr.  
Building Trades Instructor  
Normal Community High School

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