Factors Necessary in Developing a Functional Shop and Home Mechanics Course For Junior High Girls

Dale Fisher

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FACTORS NECESSARY IN DEVELOPING A FUNCTIONAL SHOP AND HOME MECHANICS COURSE FOR JUNIOR HIGH GIRLS

A Master's Report Presented to the Graduate Faculty of the Fort Hays Kansas State College in partial fulfillment of the requirements for the Degree of Master of Science

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Date July 29, 1963
Approved
Major Professor

Ralph T. Cole
Chairman Graduate Council
ABSTRACT

Dale Burton Fisher (M.S.: Department of Education)

Title: Factors Necessary in Developing a Functional Shop and Home Mechanics Course for Junior High School Girls.

Master's report directed by Dr. W. Clement Wood

The primary purpose of the investigation was to develop a functional shop and home mechanics course for junior high school girls. A secondary purpose was the determining of the grade level in which to present the course to junior high school girls.

A questionnaire was used to gather data from seventy-two former girl students who had taken shop for at least one year during the school years 1952 through 1963. Fifty-two girls returned the questionnaire which was a response of 71.1 per cent. Eighty-five activities were included in the survey. This questionnaire was developed from a review of the literature in the industrial arts field. A review of the literature was used to establish the most opportune time for presenting the course. Criteria used to determine course content were:

1. Jobs which were checked by over 60 per cent of the former girl students should be in the course content.

2. Jobs which were selected by at least 40 per cent but by less than 60 per cent, of the former students, should be used as supplementary material at a later time.

3. Jobs chosen by less than 40 per cent of the former students should be dropped from the course list.
On the basis of the data obtained, forty-two activities were selected for shop and home mechanics course material. The items chosen were in the following numerical rank: Upholstery, with three items; plumbing, with four items; finishing, seven activities; electricity, with four items; miscellaneous, with nine items; automobiles, seven items; and woodworking with seven activities.

It was apparent from the replies received, that the former students considered shop an important part of the school curriculum. The respondents who were older seemed to prefer a more practical course of work. The younger members did not want the course curriculum to become too practical as they wished art and hobby crafts to be emphasized also.

Nearly 60 per cent of the respondents thought the shop course should be a required course for at least one year. From a review of the literature and partial data from the respondents, it appeared that the shop course should be given during the eighth grade. Nearly 80 per cent of the respondents were in favor of giving grades for all shop work completed. Woodworking ranked last in order of popularity so it would seem that this phase should be emphasized less than other areas.

A review of the literature seems to indicate a definite trend toward girls being more actively involved in the industrial arts program. School administrators are becoming more concerned with providing some type of industrial arts experience for junior high girls.

This abstract of about 450 words is approved as to form and content.

Signed

Major advisor
ACKNOWLEDGMENT

The writer is deeply indebted to the many former girl students of the McDonald School, McDonald, Kansas for prompt and complete responses made to the survey. Their assistance in supplying the needed data made this survey possible.

Sincere appreciation is given to Dr. W. Clement Wood for his careful guidance and generous assistance during the progress of the study.
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CHAPTER I

INTRODUCTION

In colonial times, the home was many things to an individual. The home was the school, the mother, and the instructor. The activities of the home were nearly the entire curriculum for the colonial girl. The educational change for women began with the dame schools and continued with the academy, the seminary, and the college for women. The courses in these schools were developed for the education of women. After 1850, women increased their demands for equality with men; public feeling changed, and many schools became coeducational. To prove their educational talents and abilities were equal to those of men, women desired to pursue courses designed to prepare men for the professions. Many women entered the professional field. As the high school gradually developed into a college preparatory school, the curriculum tended to conform to the demands of the college and further neglected education specifically for girls.

Since about 1900 it has been increasingly apparent that the educational program has given little training to girls in their major vocation, the art of successful homemaking. Also, invention of new household devices and the modernizing of homes have made many phases of homemaking as new to mothers as to daughters. Mothers, in many cases, are unable to give adequate instruction for maintenance of the present home. Home economics departments were established in the schools. Sometimes this training, in certain areas, was inadequate because of
facilities, equipment, or the curriculum being followed. Often the material covered was more to train girls for careers in areas other than homemaking.

Administrators and teachers, aware of the inadequate training for girls in their educational program, began to revise the curricula. The preparation of girls for establishing and maintaining better homes was considered a major revision. A survey of trends in education for girls showed that home mechanics training was desirable as a part of the program.

The Problem

The purpose of this paper is to determine the factors necessary in developing a functional shop and home mechanics course for junior high school girls in the McDonald School at McDonald, Kansas.

Problem Analysis. In order to solve the problem of establishing a more functional course, it was necessary to answer the following questions.

1. What are the activities of girl graduates?
2. What offerings in home mechanics should be added to the course?
3. What offerings should be deleted from the present course?

Delimitations

The study was limited to seventy-three girls that had taken shop courses for at least one year and not more than two years at the McDonald School. The courses were taken in the seventh and the eighth grades. The study covers a period of eleven years, the years being 1952 through
1962.

Definition of Terms.

Activities in this study, are defined as jobs of a mechanical nature that are carried on in maintaining a home.

Home mechanics in this study refers to a certain mechanical skill and knowledge that enables the learner to make minor repairs about the home, to maintain an automobile, to be a wise consumer, and to contribute to better living in the home.

Industrial arts in this study is a phase of education that concerns itself with the materials, processes, and products of manufacture and with the contributions of those engaged in industry. The learnings come through the pupil's experience with tools and materials and through his study of resultant conditions of life.1

General Shop--Shops that are planned and equipped to teach two or more distinct types of shop work at the same time, under one teacher, are general shops. The general shop is widely used for teaching industrial arts at all grade levels.2

Background of the Study

As time passes, educational needs and patterns change. This change

1Louis V. Newkirk, Organization and Teaching the General Shop. (Boston: Chas. A. Bennett Co., Inc., 1947) p. 15.

2Newkirk, op. cit., p. 19.
is as true for a girl that will maintain a home as for the boy who enters the professions or industry. The modern home is filled with gadgets, labor saving machines, and various devices which are products of the machine age. It is, therefore, important to train girls to perform tasks of a mechanical nature, and to properly select, maintain, and use the equipment of the home. Different methods have been employed to provide this training, necessary for maintaining a modern efficient home. Four of these methods are listed.

1. Trading classes for a short period between the home economics and the industrial arts department.
2. Devoting time in the home economics department to the study of home mechanics.
3. Mixing girls with boys in the regular industrial arts classes.
4. Establish a regular course in shop and home mechanics for girls.

Any of the four methods mentioned are feasible but many factors would be involved. Some senior high schools do not have industrial arts courses. Some junior high schools do not have home economics courses although practically all senior high schools do have home economics. These problems will vary from school to school and will need study to determine just what method or curricula to adopt in teaching mechanical knowledge to girls in the school.
CHAPTER II

REVIEW OF THE LITERATURE

The main intent of this study was to find what instruction in home mechanics might be added or deleted in junior high school so that girls might become better homemakers in the modern home. There is a feeling among educators that education has been mainly for men and the minority of women who enter the professions.

A second purpose of this study is to review previous studies, such as drop-out data for girls, interest and activity of women, and previous efforts in providing industrial arts for girls.

Drop-out rate of high school girls.

The drop-out rate of high school students has been viewed with alarm. Drop-out data is necessary in developing a program of high interest to help in keeping students in school. Drop-out data is also necessary to know at which grade level to place courses so that the course will be of most benefit to the students who leave school before graduation. In the period 1951-59, the United States Office of Education reveals that of 918 students beginning the seventh grade; only 886 will begin the ninth grade; only 809 will begin the tenth grade; only 632 will begin the twelfth grade and only 582 will graduate. The preceding is for all students but the record of girls is little better than the record of boys.

Zimand stated that the majority of drop-outs for high school
students occurred at the age of 16 and at the ninth or tenth grade level.\(^3\)

Spiegler, 1950, in reporting on the problem of girls getting an education primarily designed for boys, stated that around 50% of the girls who entered high school left before they graduated. He further stated that 500,000 girls drop out of high school each year, and of this number 40,000 left school to get married.\(^4\) The figure on marriages is higher at present but recent figures do show a greater per cent of girls are finishing high school than in 1950.

The question of when drop-outs occur among high school students is of great importance to all educators concerned with curriculum building. Such information makes it possible to offer courses at the most beneficial grade level. The big drop out seems to start after the completion of the junior high grades.

General Review and Objectives of Industrial Arts.

Industrial arts seems to have received its greatest recognition in the junior high school. Before the time when most boys and girls attended senior high school, industrial arts was thought of more as vocational training. This was not the intention at the time the subject


was introduced into the junior high. Industrial arts properly taught will contribute much to the expected functions of the junior high.

Hurley states that the curriculum consists of all the experiences, including all the subject matter and skills which are utilized by the school to further the aims of education. He continues by saying, "The principal aim of education in a democratic society is to promote the general welfare by helping each individual to develop his best personal and social competence."\(^5\)

As found in all types of teaching, a formulated set of aims, intelligent selection and organization of materials, and a high type of teaching are necessary for the success of the industrial arts program. The major experiences of a general education are aimed at meeting the needs of all youth.

The industrial arts program attempts to assist pupils in becoming informed with respect to occupational interests, recreational interests, and abilities. The following nine objectives are those for which industrial art teachers should assume a large measure of responsibility. They are outcomes toward which teachers and their students can make distinctive contribution. The list as shown was adopted by the American Vocational Association.\(^6\)


1. Interest in industry.
2. Appreciation and use.
4. Cooperative attitudes.
5. Health and safety.
6. Interest and achievement.
7. Orderly performance.
8. Shop skills and knowledge.

The common general education of the elementary school, states the Educational Policies Commission of the N.E.A., should be continued through the junior high school. Supplementary to this, the student should be introduced to a wide range of experiences in intellectual fields so that he may have a broad base for the choices of interest which later he will follow more intensively.7

Industrial arts correlates closely with mathematics, knowledge and use of common measuring tools, such as rules, calipers, and gauges. Students learn to convert common fractions, and compute costs of material. In English, the spelling and meaning of technical words are learned. Understanding technical writing and just plain instructions are a part of reading. Commercial studies would include cost calculation and estimates of material used. Inventory methods are learned with regard to shop supplies and equipment. Keeping shop records, attendance, grades, progress

and accident reports are all a part of business education. Systems of filing are studied with the handling of instruction materials, blue prints, and visual aids. Planning for the correlation is a significant factor in integrating experiences for an individual. This problem is aptly stated by Friese:

Unless the school's aims, the aims of the industrial arts department and the aims of a subject for a specific grade level are agreed upon at the beginning, it is likely there will be confusion.

Safety has always been an integral part of the industrial arts curriculum. When correct manipulative skills are taught, shop safety is taught. Varied shop experiences carefully directed, under competent instruction and guidance will develop safety-conscious pupils. Safety in the curriculum means more than the formulation and enforcement of rules. Safety means the student must have a safe environment in which to work and that safe practices are a part of each pupil-experience. The teacher must set the example for proper, safe conduct. Careful and constant supervision must be provided at all times.

Many rules and regulations have been established governing the operation of machines by students. Some school systems do not permit students to operate machines until a certain age; others demand that intelligence or mechanical aptitude tests be passed; others prohibit students from operating certain machines; in many schools students operate all machines when they have the consent of parents. A teacher needs to

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thoroughly understand the regulations governing the use of machines in a school system before he demonstrates their use. The age or intelligence of a student is no standard for determining when a student should operate a machine. Where teachers have organized a systematic method of teaching each student to use each machine correctly and safely, students of all age levels and intelligence have been known to operate machines safely.\(^9\)

In large schools the shop courses may consist of various types. Much discussion has centered around the unit shop versus the general shop. The unit shop may serve the purposes of the junior high school better than the general shop; however, most smaller schools do well to provide one general shop. As the researcher was more interested in the smaller school, most discussion will be about the general shop. A general shop is one in which all industrial arts activities are carried on in one major room area. A well planned organized and supervised general shop program does enable a school, whether it be large or small, to offer a really effective course in industrial arts. The general shop offers each pupil a chance to work with a variety of tools and materials. Newkirk states that often pupils who are complete failures with one type of material can find something of value in other types.\(^10\)

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An instructor seldom finds a pupil who can get nothing whatever from the wide range of materials and activities provided in industrial arts.

The general shop is well adapted to the junior high school. This is the period when boys and girls are making wide contacts with objects and materials. The pupil needs information about things they meet in the world; they need the experience that comes from handling and knowing these products. They need to learn how to care for the electrical and mechanical devices about the home and community. They should be trained to become more efficient members of the family group, regardless of the vocation they choose. They need training in the selection of commodities which they will consume as members of a modern American Community.

It is common knowledge that pupils differ greatly in their individual differences because each pupil may work on a separate group of projects and advance as fast as he is able to do the different tasks. Perhaps no other course offers the instructor such an opportunity to judge the quality and pace of his student's work. 11

Placement

Manipulative experiences include craft production by individuals as well as mass production by groups. Since a student's ability is affected by past experience in doing manipulative work, a teacher should make a study of each student's past experiences. Many of these past

11 Newkirk, op. cit., p. 20.
experiences influence a person's ability to do shop work. The student may not have learned proper techniques at home or at some other agency. In general, students are able to develop a degree of manual dexterity in other experiences which enable them to advance more rapidly in the school situation.

Grades seven, eight, and nine form a transitional area between the elementary school and the senior high school. In the seventh grade the pupil encounters, perhaps for the first time, a different room and teacher for most subjects. Homework and personal responsibility is increased. Usually for the first time, industrial arts is offered as a separate subject, in a shop, and through a specialized instructor. At this time special emphasis and attention is given in grades seven, eight and nine, in helping pupils discover aptitudes, abilities and interests. It is often said that subject matter should be chosen or rejected exclusively on the basis of whether or not it contributes toward meeting specific objectives.

In the seventh grade, work in industrial arts should be rather simple for the first few months. The work of nearly one semester is composed of the parts that follow: (a) short jobs, lessons or projects, (b) simple manipulative work, (c) projects or jobs similar for all the class. These projects may be in metal, wood, plastics, leather and ceramics. After this introductory period of training, the pupil may begin more difficult projects. There is a noticeable trend in the direction of providing more experiences. This should be encouraged. Some of the new experiences are blueprint reading, household mechanics,
automobile care, use of electricity in the home, art metal work, furniture finishing, and jewelry.

Methodology.

Methods of teaching industrial arts have changed but methods are still as varied as apples on a tree. The McDonald School has provided shop classes for girls during the past thirteen years. At one time the procedure was divided into basic steps. This may have produced a few square boards and several kinds of wood joints but it seemed to kill the initial interest and incentive. The procedure is now different. About three weeks are spent in getting used to the tools and general procedure. The students now start making and doing things and learn the "how" as they proceed. This makes for a much happier and productive result. This quote from Mr. Charles F. Moore, vice president, of the Ford Motor Company gives some idea of the former methods used.12

I had a few curriculum hours of a course known as manual training. We spent long happy hours filling a scrap box with cross lap and mortise and tendon joints, made on command and by numbers. I sometimes felt we were attending a course in sandpaper therapy. I'm delighted to learn that better ways have been found to keep youngsters interested and out of mischief, and that the emphasis is now on developing student interest and bringing out the individual creativity that lies in each of us.

Evaluation

Evaluation is a problem in industrial arts just as it is a problem in other subject areas. With such a wide range of ability in students,

12Chas. F. Moore, Jr., Vice President of the Ford Motor Co., "Industrial Arts—Education for Modern Living" (An Address given to students winning Industrial Arts Awards, Sept. 27, 1956), p. 7.
the items produced will be greatly varied in quality and quantity. Quite often the person that has worked the hardest, will produce rather mediocre results. The McDonald School, for several years, did not give grades in shop. For two years a rather detailed report was adopted for use in shop. The quality of work did not improve. The students worried more and so did the instructor. Shop seemed more fun without definite grades. The results of this survey will tell what the students really wanted, regardless of what the school was doing.

Scope.

Newkirk and Stoddard, in 1929, discussing the value of industrial arts for girls, expressed this viewpoint. 13

The girl needs the shop experience which will enable her to become a more efficient member of the modern home. Industrial arts appreciation and the "handy-man" activities seem to be of special value as guiding aims in organization of shop content for girls.

Kroll, in 1938, expressed a like thought with this statement. 14

Women of our homes today must deal with many new devices and inventions. They must cope with the problems of their environment which invention has filled with an ever increasing multiplicity of devices. They are becoming more and more a partner of equal standing in the business of making the home a success, whether it is in the selection of a house design, a problem of interior decorating, or one of purchasing a new refrigerator. Every girl who leaves high school should have a course in industrial arts, the purpose of which should be to take into consideration these very problems which she will meet as a prospective homemaker.


In 1949, John Callahan, State Superintendent of Washington State, had this to say about girls taking industrial arts.  

"Habits, interests and attitudes and many of the skills developed through industrial arts are increasingly being recognized as valuable to girls as well as boys."

Hollenback, in 1930, stated that mechanical training for girls in the junior high school home economics class was provided for by an exchange of classes with the industrial arts department for a period of three weeks. The work experiences provided for girls centered around the use of common woodworking tools, refinishing furniture, and repairing or adjusting household electrical devices.

Fritchard, in 1945, discussing the home economics program at the Laboratory School of the University of Chicago, described their program in which junior high school boys and girls were taken into the school shops for training in the use of tools, materials, and equipment related to home economics study. As a part of their instruction in the shop, they were taught to make camping equipment, projects of wood, and other articles which were useful to them in their home economics training.

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Present Status of Participation of Girls in Industrial Arts.

Tradition has been a detrimental factor in the introduction of industrial arts experiences to girls. Thirteen years ago the McDonald School started enrolling all seventh and eighth grade girls in the industrial arts class. Several schools in western Kansas have crafts classes for girls but no other schools have been located that offer regular woodworking classes. Girls enjoy wood work and on the average take more interest than boys. Classes seem to be more successful if they are composed of all girls or all boys. Mixed classes seem to work out better in the eighth grade than in the seventh grade. Schools in many places would probably let girls take industrial arts but custom seems to discourage them from starting.

In a survey made by Veryl McKinney, at Fort Hays Kansas State College, of 2,240 students enrolled in church schools that contributed information to his survey, 461 or 20.6 per cent of this number were enrolled in industrial arts. The specific unit type of shop organization was used by 50 per cent of the participating schools. Thirty-six per cent had organized their shops on the general unit type of organization. Only 14 per cent of the schools had utilized the general industrial arts type of organization. Female students made up less than 10 per cent of the enrollment in the industrial arts courses of the educational institutions qualified to supply information to the research.18

It would seem that thirty-eight girls enrolled in industrial arts was rather low out of a total enrollment of 2,240, in the industrial arts. This was less than 2 per cent of the total enrollment or 4 per cent of the girl enrollment, if the enrollment were one-half girls. Industrial arts does not seem a popular subject for girls in the church controlled secondary schools of Kansas. The presence of such a small number of female students in the industrial arts courses of the 14 cooperating schools would seem to indicate the existence of industrial arts courses that are predominantly for the male student body.

The California Industrial Arts Guide makes no mention of industrial arts for girls in the junior high school. The guide acknowledges industrial arts as an integral part of the total educational program.  

A questionnaire was sent out to twelve supervisors of industrial arts in the metropolitan bay area near Berkley, California, and to fifty-nine industrial arts teacher educators in the ten state colleges in California. The same questionnaire was sent to teachers of industrial arts. The teachers agreed with the educators and supervisors on most subjects but disagreed on a few areas. The results are shown in the list that follows:

1. Teachers do not or would not prefer mixed classes in industrial

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20 C. O. Burke, "Industrial Objectives at the Junior High Level," Industrial Arts and Vocational Education, (September, 1956), p. 216.
2. Both groups agreed that the program should start in the seventh grade in junior high school.

3. Both groups agreed industrial arts should be limited to four or five clock hours per week.

4. Both groups agreed that girls should also have an opportunity to study industrial arts subjects. Twenty per cent had girls in one or more industrial arts classes.

The North Carolina Guide to Curriculum Study for Industrial Arts states that most of the industrial arts offerings in North Carolina are geared to masculine activities. This statement did not mean that girls should not take industrial arts.

The Washington State Industrial Arts Guide makes no mention of girls in their state program.

The Louisiana Industrial Guide makes little mention of industrial arts for girls but some schools enroll girls in the woodworking and graphic arts classes.

The Industrial Arts Guide for Missouri makes little differentiation between the needs of boys and girls. They say that the industrial arts is a laboratory which offers boys and girls of this age an opportunity for experiences in keeping with their normal growth and development.

The Industrial Arts Guide of Connecticut states that on the junior high level, all pupils participate in all areas on a rotating basis. Girls are encouraged to take industrial arts courses. In most Connecticut schools, industrial arts is an elective but in a few schools it is a
required subject. The Syllabic for Industrial Arts used in Bridgeport, Connecticut makes no mention of girls in their courses. Undoubtedly not all schools abide by the state recommendations as listed in the guide.

The Instructor's Guide for Woodwork for Junior High Schools, Tulsa, Oklahoma, speaks of the general education values of industrial arts for all youth.

The Oregon Handbook for Oregon Secondary Schools makes no reference to girls in any of the junior high courses in industrial arts. The senior high does give industrial arts for girls.

The brief survey made of several states at random seems to show a trend toward girls taking part in the industrial arts section of the curriculum. Maybe "Rosie the Riveter" and "Winnie the Welder" found out about their latent talents during the last war. Rosie and Winnie want their daughters to be able to work with their hands as well as their heads.

Content of Home Mechanics Course.

Swanson says the key to motivation probably lies in a study of the goals toward which the learner strives. There are several important characteristics that should be possessed by goals if they are to serve as effective motivators. Goals must be clear cut and concise. Recent work in the psychology of learning and literature in the industrial arts field has placed great stress on the importance of well defined goals. Goals must be accepted by the learner. It must be admitted that the goals set by the school and the teacher are not always the goals accepted
by the learner, at least initially, but if they are not achievable they
will do little toward problem solving. 21

Incentives as secondary goals are often needed to encourage pro-
gress toward more remote and general goals. It seems that the more
closely related the incentive is to the purposes of the learner, the
more effective it is to motivation. 22

A few abilities selected from Bobbitt's objectives under the
heading, "Unspecialized Practical Activities," will serve to show the
relation between industrial arts and the aims of education. The following
are of junior high utility, and when translated into specific jobs would
form a good portion of a rather diversified course in general shop.
Bobbit has this to say: 23

Ability to use all common kinds of measuring devices, measures
of length, area, volume, capacity, weight, time, value, temperature,
specific gravity; ability to sharpen, adjust, clean, lubricate, replace
worn parts, and otherwise keep household and garden tools and appliances
in good order and good working condition; ability to make repairs,
adjustments and sometimes to construct household furniture or other
equipment; ability to participate intelligently in the original
planning of one's home; ability to operate household equipment;
ability to keep the house, premises and equipment clean and san-
tary; ability to keep the house in good order; ability to care for
and operate the electrical system and appliances in one's home,
and to make simple repairs, adjustments or replacements; ability
to perform the operations involved in the care of the premises and
garden.

21 Robert S. Swanson, "Psychology of Learning and the Teaching of
Industrial Arts," Industrial Arts and Vocational Education, (October,
1956), pp. 243-44.

22 Swanson, op. cit., p. 244.

23 F. Bobbit, How to Make a Curriculum (Boston: Houghton Mifflin
Co., 1924), pp. 28, 29 and 180.
Acuff states the following objectives of industrial arts for girls. Industrial arts for girls should include experiences in the care, repair and maintenance of the home and its devices and appliances, the development of wise avocational and vocational choices, and the preparation for intelligent participation in our industrial world. To achieve these aims the ensuing objectives are suggested.²⁴

1. **Guidance.** The girl in the school shop may discover talents and aptitudes which wouldn't have been found otherwise.

2. **Consumer Education.** Many industrial products are cheaply constructed and poorly designed. They are made for the mass of the people who have little knowledge of design. Heretofore, schools have emphasized teaching the pupil to earn. The spending of money is just as important, and educators should discard the belief that somehow consumers will learn the art of living without any special training.

3. **Knowledge of Home Ownership.** To own and occupy a home of their own is the fondest dream and most frequent desire of many families.

4. **Home Mechanics.** The home of to-day, especially the kitchen, is an array of gadgets and labor-saving devices, most of which are mechanical or electrical in nature and require some degree of maintenance and care for satisfactory and economical use.

5. **Knowledge of Furniture.** The average housewife makes most of the selections of furniture for her home with very little information.

6. **Ability to Use Tools and Machines.** Learning is largely a matter of doing, especially in the manipulative processes.

7. **Drawing and Sketching.** The aim of this objective is not to enable the girl to become a draftsman but to enable her to read blueprints intelligently and make simple dimensional drawings of industrial products.

8. **Knowledge of Safety Practices.** A large percentage of accidents do not just happen but are caused—usually by negligence of an individual.

A course outline is described by Acuff. Each area of this outline is divided into two parts: manipulative and related subject matter. The material should be sufficient to cover two semesters of study. The study units are proposed for high school students but could easily be used for junior high pupils.25

I. **Woodworking**

1. **Manipulative**
   a) Learn use of simple woodworking tools.
   b) Make simple projects that will enable student to use tools and become acquainted with various woodworking procedures.
   c) Finishing and refinishing procedures.
   d) Repairing furniture.

2. **Related Subject Matter**
   a) Learn names of tools used.
   b) Study of furniture design, furniture periods, and furniture construction.
   c) Consumer knowledge of how to buy furniture wisely.
   d) Kinds of woods used in furniture, reasons for their use, and sources and procurement of lumber.
   e) Advantages and disadvantages of various finishing methods.
   f) Care of furniture.
   g) Study of veneers and their use.

II. Electrical
1. Manipulative
   a) Make extension cords, repair damaged cords on appliances.
   b) Detect and replace a blown fuse.
   c) Wire balls and buzzers.

2. Related Subject Matter
   a) Knowledge of meaning and uses of electrical terms.
   b) Brief study of electric motors and their maintenance.
   c) Study of conductors and nonconductors.

III. Mechanical Drawing
1. Manipulative
   a) Make simple drawings and sketches.
   b) Make simple house plans.

2. Related Subject Matter
   a) Learn to read blueprints.
   b) Study of types of houses and purposes of each.
   c) Brief study of building codes and their purposes.
   d) House planning.
   e) Study of building materials and advantages and disadvantages of each.

IV. Automobile Mechanics
1. Related Subject Matter
   a) Knowledge of general maintenance.
   b) Study of trouble shooting.
   c) Study of fundamental principles of an automobile.
   d) Common reasons for car not starting.
   e) Methods of washing, cleaning and polishing.

V. Household Mechanics.
1. Manipulative
   a) Repair leaky faucet.
   b) Sharpen knives.
   c) Clean a drain trap.
   d) Replace a broken glass in a window or door.
   e) Upholstering and repair of upholstery.
   f) Lubrication and care of most common electrical devices.
   g) Care and repair of garden hose.
   h) Care and use of files and stones.
   i) Heating fuels and plants and methods of control.
   j) Methods of ventilation.
VI. Crafts and Hobbies

1. Manipulative
   a) Make projects in wood carving.
   b) Make small leather projects.
   c) Make simple projects of art copper.
   d) Cut out linoleum blocks and make prints from them.

2. Related Subject Matter
   a) Knowledge of woods suitable for carving.
   b) Knowledge of source, production, and kinds of leather.
   c) Uses and kinds of plastics, and the place of plastics in the industrial world.
   d) Value of knowing a craft or having a hobby.

VII. Safety Instruction

1. Related Subject Matter
   a) Safety practices in the use of tools and machines.
   b) Safety practices in the use of home devices and electrical appliances.
   c) General safety practices of the home.

Industrial arts educators realize the defects in the educational program for girls. The scope and nature of industrial arts places it in a position to give much to the education of the modern homemaker.

In the past girls have received much of their industrial arts training in the regular boys industrial arts shop. Some schools have provided courses that meet the specific needs of girls. Most industrial arts educators feel that a home mechanics course, especially for girls, better meets their needs.
CHAPTER III

METHODS AND MATERIALS

This study was made to determine just what offerings should be added or deleted from the present shop and home mechanics course of the McDonald School, McDonald, Kansas. The material used in the questionnaire was a composite of job items suggested by other researchers and industrial arts instructors.

Jones, 1935, made a study of home mechanics for girls living in an industrial city. A list, of sixty-one items, was prepared by Jones from a questionnaire that he sent out to mothers of school girls.26

Fenn, 1933, discovered that some training could be given to girls by organizing a home mechanics club. Fenn listed thirty job items performed by the home mechanics club.27

Kroll, 1938, investigating content material for a course in home mechanics for girls, selected 156 jobs under the following areas: Woodwork, plumbing, electricity, automotive knowledge, house construction, miscellaneous, household safety, painting, finishing and decorating, and graphic arts and design.28


28 Kroll, op. cit., p. 143.
Johnson, 1939, in a study of home mechanics instruction to be offered to home economics classes in Colorado, selected the course content by a study of existing home mechanics courses. Her survey was answered by 121 respondents. A committee of eight recognized leaders in home economics chose the criterion to be used in selecting the items to be used in a home mechanics course for girls. Activities with a frequency of response of at least 60 per cent were included in course content. Responses of 40 per cent to 60 per cent were to be included as optional material.29

From a study made of the aforesaid research, the questionnaire used in this survey was developed. A list of girls was obtained from the record files of the McDonald School. This list included all girls who had taken shop for at least one year and not more than two years during the time they were in the seventh and eighth grades. The period of time covered was eleven years and the span of time was from 1952 through 1962.

A letter was mailed to seventy-three girls who had taken the shop course. This letter contained two copies of the questionnaire and a self-addressed, stamped envelope. One copy of the questionnaire was kept by the recipient. One copy was to be returned to the researcher. Seventy-three girls received questionnaires; fifty-two, or 71.1 per cent

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returned replies to the survey. On the basis of this response, the material to include or delete from future shop courses was obtained.

As this study was concerned with the activities which former girl students thought should be offered in a shop and home mechanics course, the frequency for selecting activities was used as criteria for including such items in future shop courses.

The following criteria were used for determining the shop and home mechanics offerings for girls attending the McDonald School, McDonald, Kansas.

1. Jobs checked by 60 per cent or more of the former girl students would be included in future courses.

2. Jobs checked by 40 to 60 per cent of the former students would be used as supplementary work.

3. Jobs that were checked by less than 40 per cent of the former students would not be included in future offerings.

4. Jobs that were added to the questionnaire will be investigated more thoroughly before being added to the present offerings. The additional jobs will not be considered in this study.
CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to develop a functional shop and home mechanics course for the junior high girls of the McDonald School, McDonald, Kansas. A second purpose was to determine the grade level at which the course should be presented to junior high school girls.

There were eighty-five household and shop activities listed on the questionnaire. The former girl students were asked to check the activities which they believed should be included as activities of instruction in a home mechanics course for junior high girls.

A tabulation of the average percentage of responses for the activities of each area are listed in numerical order of their popularity as follows: upholstery, 64.24 per cent; plumbing, 60.97 per cent; finishing, 56.04 per cent; electricity, 52.56 per cent; miscellaneous, 52.09 per cent; automobile, 49.27 per cent; and woodwork, 47.95 per cent.

As a part of the survey, the respondents were asked to check the activities in each area which they thought should be included in a shop and home mechanics course for junior high girls. The results of five activities found on the survey are shown in Table I. The three activities, "clean and care for wool rungs," "clean and care for synthetic rugs," "repair and cover padded seat," were checked by over 60 per cent of the respondents. Two activities, "cover lampshades," and "upholster spring cushions," were checked by more than 40 per cent but less than 60 per cent of the respondents. The item, "clean and care
for wool rugs, was the most popular item on the list.

TABLE 1

RESPONSE TO FIVE UPHOLSTERY ACTIVITIES BY FIFTY-TWO GIRL STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Upholstery Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean and care for wool rugs</td>
<td>45</td>
<td>86.5</td>
</tr>
<tr>
<td>Clean and care for synthetic rugs</td>
<td>40</td>
<td>76.9</td>
</tr>
<tr>
<td>Repair and cover padded seats</td>
<td>33</td>
<td>63.5</td>
</tr>
<tr>
<td>Cover lampshades</td>
<td>26</td>
<td>50</td>
</tr>
<tr>
<td>Upholster spring cushions</td>
<td>23</td>
<td>44.3</td>
</tr>
</tbody>
</table>

It will be noticed in Table II that seven items were listed under the plumbing activities. Four items, "shut off water supply," "shut off gas supply," "start a furnace or heater," and "read a gas or water meter," were checked by over 60 per cent of the respondents. Two activities, "repair a leaky faucet," and "make temporary repairs on a leaky pipe," were checked by more than 40 per cent but less than 60 per cent. Less than 40 per cent checked the item, "thaw out a frozen pipe." The activity, "shut off water supply," received the highest response in the area of plumbing.
TABLE II

RESPONSE TO SEVEN PLUMBING ACTIVITIES BY FIFTY-TWO GIRL STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Plumbing Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shut off water supply</td>
<td>45</td>
<td>86.5</td>
</tr>
<tr>
<td>Start furnace or heater</td>
<td>43</td>
<td>82.7</td>
</tr>
<tr>
<td>Read a gas or water meter</td>
<td>32</td>
<td>71.1</td>
</tr>
<tr>
<td>Repair a leaky faucet</td>
<td>25</td>
<td>48.1</td>
</tr>
<tr>
<td>Make temporary repairs on a leaky pipe</td>
<td>24</td>
<td>46</td>
</tr>
<tr>
<td>Thaw out frozen pipes</td>
<td>16</td>
<td>30.8</td>
</tr>
</tbody>
</table>

Fifteen finishing items are shown on Table III of which seven items were marked by 60 per cent of the respondents. The seven activities were "care for tile floors," "care for hardwood floors," "wax furniture," "remove old finish," "apply varnish," "paint walls," and "care for paint brushes." The five activities checked by at least 40 per cent but less than 60 per cent were "prepare and apply filler," "apply shellac," "apply oil finish to furniture," "prepare a wood surface for finishing," and "hard wood floor maintenance." The three items, "varnished woodwork maintenance," "apply enamel," and "use a paint sprayer," were chosen by less than 40 per cent of the respondents.
TABLE III

RESPONSE TO FIFTEEN FINISHING ACTIVITIES BY FIFTY-TWO FORMER GIRL STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Finishing Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care for hardwood floors</td>
<td>42</td>
<td>80.7</td>
</tr>
<tr>
<td>Care for tile floors</td>
<td>39</td>
<td>75</td>
</tr>
<tr>
<td>Care for paint brushes</td>
<td>38</td>
<td>73</td>
</tr>
<tr>
<td>Paint walls</td>
<td>38</td>
<td>73</td>
</tr>
<tr>
<td>Apply varnish</td>
<td>35</td>
<td>67.3</td>
</tr>
<tr>
<td>Remove old finish</td>
<td>33</td>
<td>63.5</td>
</tr>
<tr>
<td>Wax furniture</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Apply shellac</td>
<td>28</td>
<td>53.9</td>
</tr>
<tr>
<td>Prepare a wood surface for finishing</td>
<td>27</td>
<td>51.9</td>
</tr>
<tr>
<td>Hardwood floor maintenance</td>
<td>25</td>
<td>48.1</td>
</tr>
<tr>
<td>Apply an oil finish to furniture</td>
<td>24</td>
<td>46.1</td>
</tr>
<tr>
<td>Prepare and apply wood filler</td>
<td>22</td>
<td>42.1</td>
</tr>
<tr>
<td>Apply enamel</td>
<td>20</td>
<td>38.4</td>
</tr>
<tr>
<td>Varnished woodwork maintenance</td>
<td>19</td>
<td>36.7</td>
</tr>
<tr>
<td>Use a paint sprayer</td>
<td>16</td>
<td>31</td>
</tr>
</tbody>
</table>

Ten electrical activities were presented for the former students. As shown by Table IV, four items were chosen by over 60 per cent of the respondents. The four activities checked were 'locate and replace
burned out fuses," "shut off main power supply," "test or replace light bulbs," and "become familiar with basic brands of appliances."

TABLE IV

RESPONSE TO TEN ELECTRICAL ACTIVITIES BY FIFTY-TWO FORMER STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Electrical Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locate and replace burned out fuses</td>
<td>47</td>
<td>90.4</td>
</tr>
<tr>
<td>Shut off main power supply</td>
<td>42</td>
<td>80.7</td>
</tr>
<tr>
<td>Test or replace light bulbs</td>
<td>34</td>
<td>64.4</td>
</tr>
<tr>
<td>Become familiar with basic brands of appliances</td>
<td>32</td>
<td>61.5</td>
</tr>
<tr>
<td>Read an electric meter</td>
<td>28</td>
<td>53.9</td>
</tr>
<tr>
<td>Repair an electric plug</td>
<td>24</td>
<td>46.1</td>
</tr>
<tr>
<td>Reset a circuit breaker</td>
<td>22</td>
<td>42.1</td>
</tr>
<tr>
<td>Oil an electric motor</td>
<td>20</td>
<td>38.4</td>
</tr>
<tr>
<td>Make an extension cord</td>
<td>17</td>
<td>32.7</td>
</tr>
<tr>
<td>Repair a floor lamp</td>
<td>8</td>
<td>15.4</td>
</tr>
</tbody>
</table>

Two activities, "reset a circuit breaker," and "repair a floor lamp," were chosen by more than 40 per cent but by less than 60 per cent of the students. Three of the activities chosen by less than 40 per cent of the respondents were "oil an electric motor," "make an extension cord," and "repair a floor lamp."

Twenty activities of general household repair were included on the questionnaire under the miscellaneous area, as noted in Table V.
TABLE V

RESPONSE TO TWENTY MISCELLANEOUS ACTIVITIES BY FIFTY-TWO FORMER STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Miscellaneous Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharpen kitchen knives</td>
<td>45</td>
<td>86.5</td>
</tr>
<tr>
<td>Use a fire extinguisher</td>
<td>45</td>
<td>86.5</td>
</tr>
<tr>
<td>Sharpen scissors</td>
<td>44</td>
<td>84.6</td>
</tr>
<tr>
<td>Hang pictures and mirrors</td>
<td>43</td>
<td>82.7</td>
</tr>
<tr>
<td>Start a lawn mower</td>
<td>38</td>
<td>73</td>
</tr>
<tr>
<td>String ropes in pull drapes</td>
<td>35</td>
<td>67.3</td>
</tr>
<tr>
<td>Repair a stuck drawer</td>
<td>32</td>
<td>61.5</td>
</tr>
<tr>
<td>Tie common knots</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Repair window shades</td>
<td>27</td>
<td>51.95</td>
</tr>
<tr>
<td>Adjust gas burner</td>
<td>25</td>
<td>48.1</td>
</tr>
<tr>
<td>Put a connection on a garden hose</td>
<td>25</td>
<td>48.1</td>
</tr>
<tr>
<td>Repair garden hose</td>
<td>24</td>
<td>46.1</td>
</tr>
<tr>
<td>Repair plaster</td>
<td>23</td>
<td>44.3</td>
</tr>
<tr>
<td>Repair window and door screens</td>
<td>23</td>
<td>44.3</td>
</tr>
<tr>
<td>Use putty</td>
<td>19</td>
<td>36.7</td>
</tr>
<tr>
<td>Replace window glass</td>
<td>18</td>
<td>24.6</td>
</tr>
<tr>
<td>Remove old linoleum from floors</td>
<td>16</td>
<td>30.8</td>
</tr>
<tr>
<td>Lay floor tile</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Cut glass</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Bore holes in glass</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
The eight activities selected by more than 60 per cent of the respondents were "string ropes in a pull drape," "repair a stuck drawer," "hang pictures and mirrors," "use a fire extinguisher," "start a lawn mower," "sharpen kitchen knives," "sharpen scissors," and "tie common knots." Six activities listed by more than 40 per cent but by less than 60 per cent of the former students were "adjust a gas burner," "repair a garden hose," "repair window shades," "repair window and door screens," "repair plaster," and "put a connection on a garden hose." The remaining six activities, "use putty," "replace window glass," "remove old linoleum from floors," "lay floor tile," "cut glass," and "bore holes in glass were chosen by less than 40 per cent of the respondents. The item receiving the highest approval was "sharpen kitchen knives."

As indicated in Table VI, seventeen items were used that related to the maintenance and care of an automobile. Eight items, "put air in tires," "know about weights of oil used in cars," "stop a stuck horn," "check simple causes for a dead motor," "check oil in motor," "change tires," "understand panel instruments," and "wash and polish car," were chosen by over 60 per cent of the respondents. Two items, "replace spark plugs," and "know parts of a car," were chosen by over 40 per cent but by less than 60 per cent of the students. The seven items, "test battery for water," "install seat covers," "know how to remove a battery cable," "clean top of a battery," "install wiper blades," "replace fan belt," and "clean a radiator" were chosen by less than 40 per cent of the students responding to the questionnaire. The
The item chosen most frequently on the list was "change tires."

**TABLE VI**

RESPONSE TO SEVENTEEN AUTOMOBILE ACTIVITIES
BY FIFTY-TWO STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Automobile Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change tires</td>
<td>50</td>
<td>96.5</td>
</tr>
<tr>
<td>Understand panel instruments</td>
<td>39</td>
<td>75</td>
</tr>
<tr>
<td>Stop a stuck horn</td>
<td>38</td>
<td>73</td>
</tr>
<tr>
<td>Check simple causes for dead motor</td>
<td>36</td>
<td>69.2</td>
</tr>
<tr>
<td>Know about weights of oil used in a car</td>
<td>35</td>
<td>67.3</td>
</tr>
<tr>
<td>Put air in tires</td>
<td>35</td>
<td>67.3</td>
</tr>
<tr>
<td>Check oil in motor</td>
<td>34</td>
<td>64.4</td>
</tr>
<tr>
<td>Wash and polish car</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Know parts of a car</td>
<td>30</td>
<td>57.7</td>
</tr>
<tr>
<td>Replace spark plug wires</td>
<td>21</td>
<td>40.4</td>
</tr>
<tr>
<td>Test battery for water</td>
<td>20</td>
<td>38.4</td>
</tr>
<tr>
<td>Install seat covers</td>
<td>19</td>
<td>36.5</td>
</tr>
<tr>
<td>Know how to remove a battery cable</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Clean top of a battery</td>
<td>12</td>
<td>23.1</td>
</tr>
<tr>
<td>Install wiper blades</td>
<td>9</td>
<td>17.3</td>
</tr>
<tr>
<td>Replace fan belt</td>
<td>8</td>
<td>15.4</td>
</tr>
<tr>
<td>Clean a radiator</td>
<td>6</td>
<td>11.5</td>
</tr>
</tbody>
</table>
Eleven woodworking activities were listed on the survey. Table VII reveals that the five items, "identify and be able to use common tools," "repair toys," "make and be able to read simple blueprints," "make picture frames," and "make and be able to read simple furniture plans," were chosen by over 60 per cent of the respondents. Three activities, "make and understand simple drawings," "repair furniture drawers," and "construct simple pieces of furniture," were checked by more than 40 per cent but by less than 60 per cent of the respondents. Less than 40 per cent chose the three items, "hinge fitting," "door fitting," and "make wood joints." The two items, "identify and be able to use common tools," and "repair toys," were chosen as the most desired activities.

TABLE VII

RESPONSE TO ELEVEN WOODWORKING ACTIVITIES BY FIFTY-TWO FORMER STUDENTS, 1952 THROUGH 1962.

<table>
<thead>
<tr>
<th>Woodworking Activities</th>
<th>Frequency</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and be able to use common tools</td>
<td>37</td>
<td>71.1</td>
</tr>
<tr>
<td>Repair toys</td>
<td>37</td>
<td>71.1</td>
</tr>
<tr>
<td>Make and be able to read simple blueprints</td>
<td>32</td>
<td>61.7</td>
</tr>
<tr>
<td>Make picture frames</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Make and be able to read simple furniture plans</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Repair furniture drawers</td>
<td>25</td>
<td>48.1</td>
</tr>
<tr>
<td>Construct simple pieces of furniture</td>
<td>23</td>
<td>44.3</td>
</tr>
<tr>
<td>Hinge fitting</td>
<td>8</td>
<td>15.4</td>
</tr>
<tr>
<td>Door fitting</td>
<td>5</td>
<td>9.9</td>
</tr>
<tr>
<td>Make wood joints</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
Four additional questions were included in the questionnaire. The answers of the respondents are shown in Table VIII. The students answering the survey were also asked to list any suggestions that might be used in better preparing a course for girls in home mechanics. A large majority of the former girl students regarded shop as an important part of the school curriculum, with only three individuals regarding shop as a waste of time. The respondents that had been out of school the longest time, seemed to be more interested in the practical aspects of the course. One former student made this statement, "A home is only in working order as long as the modern appliances are in working condition." Three members did not want the course curriculum to become too practical as they wished art and hobby crafts to be emphasized also.

### TABLE VIII

**RESPONSE TO FOUR QUESTIONS REGARDING SHOP BY FIFTY-TWO FORMER STUDENTS, 1952 THROUGH 1962.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Two years</th>
<th>One Year</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think all girls should be required to take shop?</td>
<td>35</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you think the course should be elective?</td>
<td></td>
<td></td>
<td>16</td>
<td>36</td>
</tr>
<tr>
<td>Should shop work be a one-year or two-year course?</td>
<td>45</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Should grades be given for shop work?</td>
<td>41</td>
<td>11</td>
<td></td>
<td></td>
</tr>
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CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary.

It was the primary purpose of the study to develop a functional shop and home mechanics course for junior high girls in the McDonald School, McDonald, Kansas. A second purpose of the study was to determine at what grade level the course should be offered to junior high school girls.

A questionnaire was used to gather information to determine the best course material to offer in developing a home mechanics course for junior high girls. This questionnaire was developed from a study of the literature in the industrial arts field. Eighty-five activities were selected for the questionnaire from a list of 200 items previously developed by Fenn, Jones, Kroll, and Johnson. The items chosen were divided into seven areas for consideration by the respondents. The seven areas used were electricity, miscellaneous, automobiles, woodworking, upholstery, plumbing, and finishing.

The second purpose of the study was to determine the grade level at which the shop course should be offered to junior high school girls. This question was considered from a review of the literature on the subject. The drop-out age of girls was the determining factor in deciding on the grade level at which to present the shop course. The answers and suggestions received from the respondents also offered some evidence helpful in determining material from which to make assumptions.
regarding the second part of the problem being studied.

The questionnaire was sent to seventy three former girl students who had taken the regular shop course for at least one year during the school years 1952 to 1962. Fifty-two girls returned the survey which was a response of 71.1 per cent.

The criteria established in the present study for the selection of a shop and home mechanics course content was based on the frequency of responses by the individuals that returned the survey. A review of the literature was used to establish the most opportune time for presenting the course. The procedure for measuring frequency was the same as that used by Johnson. The criteria used to determine course content were:

1. Jobs which were checked by 60 per cent or more of the former girl students should be included in the course content.

2. Jobs which were checked by 40 to 60 per cent of the former girl students should be used as supplementary course material. This material would be used as needed and as time would permit.

3. Jobs that were added to the questionnaire will be investigated more thoroughly before being added to the present course. The additional jobs will not be considered in this study.

On the basis of the data obtained, the following forty-two activities for shop and home mechanics instruction were selected from the eighty-five activities presented on the questionnaire. Over 60

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30Johnson, op. cit., p. 97.
per cent of the respondents chose the following activities as course content for a shop and home mechanics course.

**Upholstery**
- Repair and cover padded seats.
- Clean and care for wool rugs.
- Clean and care for synthetic rugs.

**Plumbing**
- Shut off gas supply.
- Shut off water supply.
- Start furnace or heater.
- Read a gas or water meter.

**Finishing.**
- Care for tile floors.
- Care for hardwood floors.
- Wax furniture.
- Remove old finishes.
- Apply varnish.
- Paint walls.
- Care for paint brushes.

**Electricity**
- Shut off main power supply.
- Become familiar with the basic brands of appliances.
- Locate and replace burned out fuses.
- Test or replace light bulbs.
Miscellaneous

String ropes in pull drapes.
Repair a stuck drawer.
Hang pictures and mirrors.
Use a fire extinguisher.
Start a lawn mower.
Put a connection on a garden hose.
Sharpen scissors.
Sharpen kitchen knives.
Tie common knots.

Automobiles

Change tires.
Understand panel instruments.
Stop a stuck horn.
Check simple causes for dead motor.
Know about weights of oil used in a car.
Check oil in motor.
Wash and polish a car.

Woodworking

Make picture frames.
Repair toys.
Repair furniture drawers.
Repair broken furniture.
Make and understand simple building drawings.
Make and be able to read simple furniture plans.
Identify and be able to use common hand tools.

**Limitations of this Study.**

Three limiting factors were present in this study. They were the following:

1. The limited number of respondents available to answer the questionnaire.
2. The rather brief listing of available items in the areas of upholstery and plumbing.
3. The possibility that variables of a personal nature might have affected the replies submitted.

**Conclusions**

From the data gathered from the survey and the data obtained from a review of the literature, subject to the limitations mentioned above, the following conclusions were drawn.

1. The age of the respondents seemed to have some bearing on the way the survey was answered.
2. The complete shop and home mechanics course should be revised in the McDonald School.
3. There is a definite trend toward girls being more actively involved in the industrial arts program.
4. From a study of the drop-out age, it would seem that the eighth grade would be the proper grade level to present the other areas of shop work.
5. From the evidence obtained from the questionnaire, it would seem that grades should be given for all shop work.
Recommendations.

From the data presented by this survey and a review of the literature, the following recommendations are made:

1. Industrial arts, for girls, should be a two-year offering in the junior high school.

2. The courses, offered in the junior high school, should be required for one year and be elective for one year.

3. Grades should be given for all shop courses in the junior high school.

4. The course offerings, in industrial arts for girls, should be revised at least every five years.

5. School administrators should be more concerned with providing some type of industrial arts experience for junior high girls.
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Moore, Chas. F. Jr., Vice-President of the Ford Motor Co. "Industrial Arts-Education for Modern Living." An address to Students Winning Industrial Arts Awards, September 27, 1956.


Swanson, Robert S. "Psychology of Learning and the Teaching of Industrial Arts," Industrial Arts and Vocational Education, (October, 1956), 243-244.

Dear Friend,

As a former student of this school, you can do the school and me a favor by filling out the enclosed questionnaire and returning it.

Our grade school shop work has not changed to any great extent over the years. The work has been slanted toward the needs of boys. The girls have taken about the same work as the boys. It is my plan to try to develop a program that will be of more practical value to the girls that take shop. Of course, it would be impossible to offer all the items listed but I wish to make a wise choice of the ones listed.

Check with an X the items that you would include in a shop course for girls. Add items to the list that you think should be given. Your written comments will be appreciated.

This letter will be sent to the last eleven classes that have graduated from the McDonald Grade School.

Please don't lay this questionnaire aside. I would like to complete this study within the next two months.

Yours truly,

/s/ DALE B. FISHER, Principal
APPENDIX B

Questionnaire Sent to Former Girl Students
Finishing Jobs

1. ___ Use a paint sprayer.
2. ___ Care for paint brushes.
3. ___ Paint walls.
4. ___ Prepare and apply wood filler.
5. ___ Apply enamel.
6. ___ Apply varnish.
7. ___ Apply shellac.
8. ___ Apply an oil finish to furniture.
9. ___ Prepare wood surface for finishing.
10. ___ Remove old finishes.
11. ___ Wax furniture.
12. ___ Care for hardwood floors.
13. ___ Care for tile floors.
14. ___ Hardwood floor maintenance.
15. ___ Varnished woodwork maintenance.

Woodwork

1. ___ Identify and be able to use common hand tools.
2. ___ Construct simple pieces of furniture.
3. ___ Make and be able to read simple furniture plans.
4. ___ Make and understand simple building drawings.
5. ___ Repair broken furniture.
6. ___ Hinge fitting.
7. ___ Door fitting.
8. ___ Repair furniture drawers.
9. ___ Make common wood joints.
10. ___ Repair toys.
11. ___ Make picture frames.

Electricity

1. ___ Test or replace light bulbs.
2. ___ Locate and replace burned out fuses.
3. ___ Reset a circuit breaker.
4. ___ Make an extension cord.
5. ___ Repair an electric plug.
6. ___ Read an electric meter.
7. ___ Oil electric motors.
8. ___ Become familiar with the basic brands of appliances.
9. ___ Repair a floor lamp.
10. ___ Shut off main power supply.
Upholstery

1. **Repair and cover padded seats.**
2. **Upholster spring cushions.**
3. **Clean and care for wool rugs.**
4. **Clean and care for synthetic rugs.**
5. **Cover lampshades.**

Plumbing

1. **Read a gas or water meter.**
2. **Repair a leaky faucet.**
3. **Make temporary repairs on a leaky pipe.**
4. **Thaw out a frozen pipe.**
5. **Start furnace or heaters.**
6. **Shut off water supply.**
7. **Shut off gas supply.**

Automobile

1. **Wash and polish a car.**
2. **Clean a radiator.**
3. **Understand panel instruments.**
4. **Change tires.**
5. **Check oil in motor.**
6. **Test battery for water.**
7. **Check simple causes for dead motor.**
8. **Install wiper blades.**
9. **Replace a fan belt.**
10. **Install seat covers.**
11. **Stop a stuck horn.**
12. **Know parts of a car.**
13. **Know about weights of oil used in cars.**
14. **Know how to remove a battery cable.**
15. **Replace spark plug wires that are disconnected.**
16. **Put air in the tires.**
17. **Clean top of battery.**

Miscellaneous

1. **Replace window glass.**
2. **Cut glass.**
3. **Repair plaster.**
4. **Repair window and door screens.**
5. **Sharpen kitchen knives.**
6. **Repair window shades.**
7. **Sharpen scissors.**
8. **Repair garden hose.**
9. **Put a connection on a garden hose.**
10. ___ Start a lawn mower.
11. ___ Tie common knots.
12. ___ Lay floor tile.
13. ___ Use a fire extinguisher.
14. ___ Bore holes in glass.
15. ___ Use putty.
16. ___ Hang pictures and mirrors.
17. ___ Remove old linoleum from floors.
18. ___ Repair a stuck drawer.
19. ___ String ropes in pull drapes.
20. ___ Adjust gas burners.

Questions

1. Do you think all girls should be required to take shop?
2. Do you think the course should be elective?
3. Should shop work be a one or a two year course?
4. Should grades be given for shop work?

Suggestions