

A STUDY OF FACTORS WHICH INFLUENCE THE FEMALE
JUNIOR HIGH STUDENT TO STUDY
IN INDUSTRIAL ARTS

By

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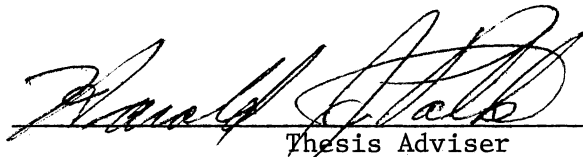
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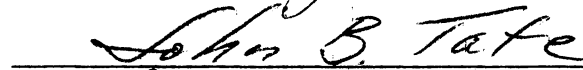
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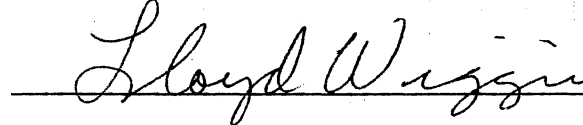
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CHAPTER I

INTRODUCTION

The student's motivation to study must begin at an early age.¹ Early adolescence is the time of life when becoming begins to take shape as being. Education may facilitate his maturation, clarify his confusion, stimulate his imagination, and maximize his alternatives. Or, it may retard his development, confound his understanding, stifle his creativity, and restrict his choices.²

Industrial arts is studied chiefly by males, but the United States Department of Labor reported that two in five of the work force are female, many of whom work in industry. It is estimated that today's adolescent girl will work, on the average, about 25 years outside the home.³ One observed change is found in manufacturing where there has been marked shift from heavy to light work, which means that females are now better able to meet these reduced physical demands. But fields such as woodworking and metal working still are not encouraging female students to enroll in them.

¹George Bugliarello, Women in Engineering (New Hampshire, July 12-16, 1971), p. 94.

²Daniel L. Householder, "Industrial Arts for the Early Adolescent," American Council on Industrial Arts Teacher Education, 21st Yearbook (1972), p. 15.

³H. H. London, "The Place and Function of Industrial Arts in Preparing Youth for the World of Work," Theory into Practice, Vol. 9 (December, 1970), p. 297.

The fields of study are sexless. The reason that sex labels have to be carried into industrial arts class is because culture and society have given the male students more chances to learn related activities before they enter the classes. When the teachers demonstrate the operation of the machines, the male students pick it up and learn it faster than do female students. The female students have to learn it from the very beginning because of their lack of technological information.

In Simmons' speech, she indicated:

We are all products, indeed, victims of our acculturation process. We have been conditioned by the home, the school, church, government, communities, communications media, social, civic, professional and fraternal organizations and affiliations, to name but a few. All these social institutions have contributed to what we think, feel and believe.⁴

Starting in the school to improve the situation and to strengthen accurate concepts will be a good beginning toward eliminating the inequalities in education which prevent the female students from studying and working in industrial arts.

Statement of the Problem

Industrial arts is an important part of education and an important aspect of learning how to live and work in a complex industrial society.⁵ The female students who enroll in industrial arts in high school are

⁴Barbara L. Simmons, "Should Women Have Equal Education and Employment Opportunities?" Women in the World of Work (Washington, October, 1974), p. 2.

⁵James E. Biggs, "A Study of Factors That Could Be Influential in the Selection of Students for Entrance Into Industrial Arts Programs in Junior High School" (unpub. M. S. Thesis, Oklahoma State University, 1972), p. 2.

still in the minority. The results limit the female's occupational selection in today's labor force.

The factors which influence the junior high female student's involvement in industrial arts programs could be social background or the attitudes of educators toward pre-vocational programs for female students. The study is an attempt to compile a list from data gathered that would make available for curriculum specialists, teachers and counselors a reliable source of the significant factors, internal and external, which may influence female student's tendency to study in industrial arts.

Purpose of the Study

The purpose of this study is to identify and evaluate the many factors which influence the junior high female student's tendency to study in industrial arts.

The proper use of the findings of the study by counselors could help the female students enrolled in industrial arts courses according to the interests, and avoid the influence of the traditional role. Negative counseling must stop.

Hypotheses

Based on information found in review of literature pertaining to factors which influence the junior high female student's involvement in industrial arts program, the following hypotheses were adopted for the study:

- (1) Family background makes no difference on a junior high female student's tendency to study in industrial arts.
- (2) The repair experience in industrial arts makes no difference

on a junior high female student's tendency to study in industrial arts.

(3) The scholastic inventory makes no difference on a junior high female student's tendency to study in industrial arts.

(4) Personal attitude toward the traditional role makes no difference on a junior high female student's tendency to study in industrial arts.

(5) The working experience in an industrial shop makes no difference on a female student's tendency to study in industrial arts.

(6) Her career selection makes no difference on a junior high female student's tendency to study in industrial arts.

(7) Arts, activities, subjects, and literature preference makes no difference on a junior high female student's tendency to study in industrial arts.

Definition of the Terms

- (1) Repair experience: any minor repairing work relative to industrial arts in the shop classroom, or the personal experience in the shop.
- (2) Industrial experience: the experience of junior high students visiting the industrial factory and working on machines in the shop class or any private shop.
- (3) Early adolescent: the sixth, seventh and eighth graders who are during the early period of growing from childhood to maturity.
- (4) Scholastic inventory: specially indicated junior high level Math and Science, which related to industrial arts.
- (5) Group A and group B: group A is the students who are interested in industrial arts; group B is the students who are not interested in industrial arts.

Limitation of the Study

This study is limited to the seventh and eighth female students currently enrolled in the Stillwater Middle School, Stillwater, Oklahoma, where the Oklahoma State University (OSU) is located.

The population of Stillwater is approximately 35,000 with a public school population of 4,630, many of these students are the daughters of the faculty of OSU.

CHAPTER II

REVIEW OF LITERATURE

American educators have expressed a great deal of concern about meeting individual differences in the classroom, but the most significant individual differences of all--sex--has received little attention.¹ Early adolescence is a crucial period for the development of sex-role identifications. The changing from a rural to an industrial society in the United States has obscured traditional sex roles. One study has documented the difficulty lower-class boys have in building a masculine image of themselves when fathers are absent.² Children learn sexual stereotypes at an early age, and by the age of eight or nine, they have already gotten the message that only certain choices are available, and that these choices are based on sex.³ For instance, girls are helpers--the books that schoolgirls read prepare them early for the goal of marriage, hardly ever for work, and never for independence.⁴

While testing instruments presently available show no difference between the sexes in basic intelligence, achievement tests generally

¹Walter B. Kolesnik, "Sex Differences and Education," America, Vol. 108 (April, 1963), p. 552-555.

²Daniel Moynihan, The Negro Family (Washington, 1966).

³Barbara Harrison, "Feminist Experiment in Education," The New Republic, Vol. 166, No. 11, Issue 2985 (March 11, 1972), p. 16.

⁴Florence Howe, "Sexual Stereotypes Start Early," Saturday Review (October 16, 1971), p. 92.

show girls superior in language skills, boys in arithmetic reasoning and science.⁵ Taylor's speech pointed out the sex difference is caused by the feminine role in society. Females are trained from childhood to be helpless and subservient. They are given dolls and nurse's outfits as toys; boys are given trains, cars, and doctor's outfits. When they get to junior high and high school, girls are counseled to focus on English, literature, and foreign language but to avoid mathematics and sciences. They are advised to become teachers or nurses but not doctors or engineers.⁶ Mrs. Koontz spoke to the educators concerning the attitude of educators toward the female students:

You'll have to start your advertising down in the elementary school. You'll have to begin producing materials that say to young girls in first and second grade: "You can be a doctor. You can be an engineer. You can make appliances. You can repair typewriters. You don't have to think that typing is the only thing you can do.

Education is of crucial importance during the early adolescent years. During this time, young people consciously and unconsciously formulate tentative decisions relative to their interest in further education as it is represented in the formal schools.⁸

The study of women's equality was performed by Mary L. Ellis. She pointed out that in preparing students for future careers, the edu-

⁵ Lewis M. Terman and E. Leona Tyler, "Psychological Sex Differences," Manual of Child Psychology (1954), p. 1064-1114.

⁶ Rhobia C. Taylor, "The Changing Composition of the Nation's Labor Force," Woman in the World of Work (Washington, October, 1974), p. 35.

⁷ Elizabeth D. Koontz, "The Question Before Us," Women in Industry (New York, 1971), p. 40.

⁸ Daniel L. Householder, "Industrial Arts for the Early Adolescent," American Council on Industrial Arts Teacher Education, 21st Yearbook (1972), p. 16.

cational system must become more flexible in order to adapt the curricula and training programs more quickly to changing labor-market demands.⁹

Elizabeth J. Simpson proposed that an orientation to the whole area of vocational preparation for women should be provided to teachers of such educational subjects as English and social studies. Alternatives and supplements to in-school instructional programs should be employed to expand training options and opportunities for both sexes. New students text materials, which present a variety of socially constructive life styles and roles, including a variety of occupational roles for women, should be developed and tested.¹⁰

The study presented by the Ohio State University discussed the school system. It indicated that the vocational education program, as it exists, shows a need for a good model to be used as a guide in developing a program of education for girls and women. Criteria must be defined for developing programs of occupational preparation. A comprehensive evaluation would seem to include instructional objectives as well as social and economic objectives, and would require the development of more adequate and appropriate measures. The image of the world of work can be brought closer to reality for the youngsters by activities such as: emphasize what people do through the use of films, television and trips to industry and business and other places of

⁹ Mary L. Ellis, "Social Implications of Women's Equality," Women in the World of Work (Washington, October, 1974), p. 31.

¹⁰ Elizabeth J. Simpson, "Career Education--Feminine Version," Women in the World of Work (Washington, 1974), p. 51.

¹¹ Sylvia L. Lee, Implication of Women's Work Patterns for Vocational and Technical Education (Ohio, 1967), ED 016-812.

employment.

According to the report of the Department of Labor, between 1947 and 1971, the female labor force almost doubled. Female labor growth between 1960 and 1971 totaled over a million, fully a third larger than the increase registered during the preceding 13 years.¹² The Equal Employment Opportunity Act of 1972 gave the Equal Employment Opportunity Commission authority to enforce Title VII of the Civil Rights Act of 1964, which prohibits discrimination in employment because of race, color, religion, sex, or national origin. Title IX of the Education Amendments of 1972 was a major step forward in prohibiting discrimination in education at all levels.¹³ Under the laws protection, women at all levels of work should attempt to find greater satisfaction in their working situation by planning and aspiring to their positions rather than considering jobs only as a supplementary income.¹⁴

Educators should consider new curriculum and programs to confront the changing labor market situation. For many years, industrial arts offerings for early adolescents were quite consistent in terms of content and clientele. Junior high school students were enrolled in wood-working, drafting, and metalworking courses, with an occasional foray into electricity, printing, and power mechanics. Substantial effort has recently been devoted to the up-dating and development of the industrial

¹²U. S. Department of Labor, Manpower Report of the President (Washington, 1973), p. 65.

¹³U. S. Citizen's Advisory Council on the Status of Women, Women (Washington, 1973), p. 7.

¹⁴Russell W. Peterson, "Women in the World of Work," Women in the World of Work (Washington, 1973), p. 141.

arts program.¹⁵ Some schools call this type of the curriculum pre-vocational. The program contained college preparatory subjects, mechanical subjects and commercial subjects.¹⁶ A frequent and valid criticism of the junior high school pre-vocational offerings is that the preparation is not really for a wide range of occupations, but generally for those occupations represented in the high school vocational education offerings.¹⁷

The early adolescent has no idea of what to expect. He is bombarded from all quarters with the expectations of others. They make contradictory demands on his time, energy, personality, capability, intellect, and credulity. He is expected to make sense of a world in which he has no influence, and to contain, with good grade, the revolution within.¹⁸

¹⁵Householder, p. 18.

¹⁶M. R. Sumption, "The Problem of the Small High School," (Illinois, 1958) ED 010-960.

¹⁷Alan R. Suess, "The Industrial Arts Curriculum for the Early Adolescent," American Council on Industrial Arts Teacher Education, 21st Yearbook (1972), p. 123.

¹⁸John P. Schenck, "Early Adolescence: The Revolution Within," American Council on Industrial Arts Teacher Education, 21st Yearbook (1972), p. 39.

CHAPTER III

METHOD OF RESEARCH

For the purpose of finding the factors that could have an influence on the tendency of the junior high female student's involvement in industrial arts programs, it was decided that a questionnaire would be the best method of collecting the data. The questionnaire used was patterned after questionnaires used in a similar study done by James E. Biggs.¹

Each female student in the seventh and eighth grade (150 of seventh graders, 163 of eighth graders) were asked to answer the questionnaire. The questionnaire was administered on the 22nd of May, 1975. Help in administering the questionnaire was obtained from two OSU students. The place of administration was in the physical education classes at the Stillwater Middle School. It was found that approximately 20 minutes was required for completing the questionnaire.

The data from the questionnaire was tabulated and compared under seven main areas: (1) Family background; (2) Repair experience; (3) Scholastic inventory; (4) Personal attitude; (5) Industrial experience; (6) Career selection; (7) Arts, activities, subjects, and literature preference. Data treated by statistical test which is chi-square test.

¹James E. Biggs, "A Study of Factors That Could Be Influential in the Selection of Students for Entrance Into Industrial Arts Programs in Junior High School" (unpub. M. S. Thesis, Oklahoma State University, 1972), p. 2.

Frequency counts and percentages comparing students on the selected characteristics are shown in the tables.

From the results tabulated after the questionnaire was completed by the students the researcher tested the hypotheses and made her conclusions and recommendations.

CHAPTER IV

PRESENTATION AND ANALYSES OF DATA

Introduction

The purpose of this study was to identify and evaluate the many factors which could be influential in the female junior high student to study in industrial arts.

Data for the study were collected through the use of questionnaire which was administered to 313 junior high seventh and eighth grade female students.

Data treated were of such a nature that analyses by non-parametric tests were deemed appropriate. The statistical test was the chi-square test of goodness of fit. Frequency counts and percentages comparing students on the selected characteristics are shown in various tables.

Not all students responded to every item on the questionnaire since all items did not apply to all students. The questionnaires were administered to 313 students and returned by 295, giving a response of 94.25 percent. The questionnaires were divided into two groups, (A) students who are interested in industrial arts and, (B) students who are not interested in industrial arts, which was ascertained by question #7 of the questionnaire. Table I illustrated the distribution of the two groups.

TABLE I
DISTRIBUTION OF STUDENTS INCLUDED IN THE STUDY

Group	Frequency	Percent
(A) Interested in Industrial Arts	158	53.6
(B) Not Interested in Industrial Arts	137	46.4
Total	295	100.0

Family Background

Father's Occupation

Table II presents an analysis of the occupation of the student's father. Data related to father's occupation were classified in two major parts: (1) occupation which is related to industrial arts including the categories of machine trades, benchwork, structure, and engineering which is classified in the category of Professional, Technical and Managerial Occupation,¹ (2) occupation which is not related to industrial arts.

The number of students who reported that their father's occupation related to industrial arts in group A and group B are 22.2 and 20.4 percent respectively. The number of students who reported that their father's occupation were not related to industrial arts in group A and

¹U. S. Department of Labor, "Definition of Titles," Dictionary of Occupational Titles (Washington, 1965), p. 5.

group B are 77.8 and 79.6 percent respectively.

In Table II, yield of a chi-square value of .13 with one degree of freedom was not judged significant at the .05 level. Therefore, the null hypothesis that the type occupation the father has makes no difference on a student's tendency to study in industrial arts was accepted.

TABLE II
FAMILY BACKGROUND, SET I

Father's Occupation	Group A		Group B	
	frequency	percent	frequency	percent
Related To Industrial Arts	35	22.2	28	20.4
Not Related To Industrial Arts	123	77.8	109	79.6
Total	158	100.0	137	100.0

Chi-square = .128 χ^2 at .05 level = 3.841

Mother's Occupation

The number of students who reported that their mother's occupation related to industrial arts in group A and group B are 2.5 and 4.4 percent respectively. The number of students who reported that their mother's occupation were not related to industrial arts in group A and

group B are 97.5 and 95.6 percent respectively.

Table III shows that the chi-square value of .765 with one degree of freedom was found insignificant at the .05 level. The null hypothesis that the type occupation of the student's mother makes no difference on the student's tendency to study in industrial arts was accepted.

TABLE III
FAMILY BACKGROUND, SET II

Mother's Occupation	Group A		Group B	
	frequency	percent	frequency	percent
Related to Industrial Arts	4	2.5	6	4.4
Not Related to Industrial Arts	154	97.5	131	95.6
Total	158	100.0	137	100.0

Chi-square = .765 χ^2 at .05 level = 3.841

An Older Brother

Table IV presents an analysis of having an older brother in the student's family. Comparison of the percentages of two groups reveals that 48.7 percent of group A students have an older brother. There are 53.0 percent students of group B that have an older brother.

However, a chi-square value of .525 with one degree of freedom

was found to be insignificant at the .05 level. The null hypothesis was accepted.

TABLE IV
FAMILY BACKGROUND, SET III

An Older Brother	Group A		Group B	
	frequency	percent	frequency	percent
Yes	76	48.7	71	53.0
No	80	51.3	63	47.0
Total	156	100.0	134	100.0

Chi-square = .525 χ^2 at .05 level = 3.841

Career Selection

Jobs Available for Girls in Today's Society

Table V presents an analysis of data about the student's opinion concerning the type of jobs most available for females in today's society. Approximately twenty percent (20.3) of group A and seventeen percent (16.9) of group B think the jobs related to industrial arts are available for females. Approximately eighty percent (79.7) of group A and eighty-three percent (83.1) of group B don't believe that the jobs related to industrial arts are available for females in today's society.

TABLE V
CAREER SELECTION, SET I

Jobs Available for Today's Females	Group A		Group B	
	frequency	percent	frequency	percent
Related to Industrial Arts	109	20.3	83	16.9
Not Related to Industrial Arts	427	79.7	409	83.1
Total	536	100.0	492	100.0

Chi-square = 2.03 χ^2 at .05 level = 3.841

A chi-square value of 2.03 with one degree of freedom was found to be insignificant at the .05 level. The null hypothesis that the students think the jobs related to industrial arts are available for females in today's society makes no difference on the student's tendency to study in industrial arts was accepted.

Job Selection in Future

Analysis of the student's future job selection indicates that 20.4 percent of group A and 2.3 percent of group B chose the jobs which are related to industrial arts.

However, a chi-square value of 22.2 with one degree of freedom was found to be significant at the .05 level on Table VI. It was judged that the students interested in industrial arts would select the future jobs related to industrial arts. Therefore, the null hypothesis that

the type of career selection makes no difference to the student's tendency to study in industrial arts was rejected.

TABLE VI
CAREER SELECTION, SET II

Job Selection in Future	Group A		Group B	
	frequency	percent	frequency	percent
Related to Industrial Arts	31	20.4	3	2.3
Not Related to Industrial Arts	121	79.6	130	97.7
Total	152	100.0	133	100.0

Chi-square = 22.21 χ^2 at .05 level = 3.841

Repair Experience in Industrial Arts

Minor Repair Experience

Table VII presents an analysis of data from the student's minor repair experience which is related to industrial arts. Eighty-six point five percent of group A and seventy point four percent of group B had minor repair experience.

An analysis of the data yielded a chi-square value of 11.0 with one degree of freedom was found to be significant at the .05 level. Therefore, the null hypothesis that the student's minor repair

experience makes no difference on her tendency to study in industrial arts was rejected.

TABLE VII
REPAIR EXPERIENCE IN INDUSTRIAL ARTS, SET I

Have Minor Repair Experience	Group A		Group B	
	frequency	percent	frequency	percent
Yes	134	86.5	95	70.4
No	21	13.5	41	29.6
Total	155	100.0	135	100.0

Chi-squares = 11.0

X^2 at .05 level = 3.841

Tendency in Repairing

Table VIII presents an analysis of data of the student's tendency to repair her own equipment. The students who attempt to repair their bicycle by themselves are 53.3 and 33.1 of group A and B, respectively.

A chi-square value of 11.74 with one degree of freedom was found to be significant at the .05 level. The null hypothesis that a student's repair tendency in industrial arts makes no difference on the student's tendency to study in industrial arts was rejected.

TABLE VIII
REPAIR EXPERIENCE IN INDUSTRIAL ARTS, SET II

Tendency in Repairing	Group A		Group B	
	frequency	percent	frequency	percent
Positive	80	53.3	44	33.1
Negative	70	46.7	89	66.9
Total	150	100.0	133	100.0

Chi-square = 11.74

X^2 at .05 level = 3.841

Scholastic Inventory

Math Grade Average

Table IX of data presents the student's Math grade average and its relation to the student's tendency to study in industrial arts. It was found that 35.3, 38.5 and 19.8 percent had A, B and C respectively in group A while 27.4, 34.8 and 28.9 percent had A, B and C grade respectively in group B.

A chi-square value of 5.26 with four degrees of freedom was judged to be insignificant at the .05 level. Therefore, it was judged that the average grade in Math makes no difference in student's tendency to study in industrial arts was accepted.

TABLE IX
SCHOLASTIC INVENTORY, SET I

Math Grade Average	Group A		Group B	
	frequency	percent	frequency	percent
A	55	35.3	37	27.4
B	60	38.5	47	34.8
C	31	19.8	39	28.9
D	7	4.5	10	7.4
F	3	1.9	2	1.5
Total	156	100.0	135	100.0

Chi-square = 5.26

X^2 at .05 level = 9.488

Science Grade Average

Table X presents the student's Science grade average and its relation to study in industrial arts. It was found that 32.5, 45.2 and 18.5 percent, respectively, in group A had A, B and C grade while 31.6, 39.7 and 19.1 percent respectively, in group B had A, B and C grade.

Yield of a chi-square value of 4.62 with four degrees of freedom was not judged significantly at the .05 level. Therefore, the null hypothesis that the Science grade average makes no difference in the student's tendency to study in industrial arts was accepted.

TABLE X
SCHOLASTIC INVENTORY, SET II

Science Grade Average	Group A		Group B	
	frequency	percent	frequency	percent
A	51	32.5	43	31.6
B	71	45.2	54	39.7
C	29	18.5	26	19.1
D	5	3.2	9	6.6
F	1	0.6	4	2.9
Total	157	100.0	136	100.0

Chi-square = 4.62

χ^2 at .05 level = 9.488

Personal Attitude Toward the Traditional Role

Attitude Toward Neatness

Table XI presents an analysis of data about attitudes of female students concerning neatness. Comparison of percentages in two groups proved to be similar. There are 24.5 percent of group A and 34.3 percent of group B agreed that a girl should keep things neat.

A chi-square value of 3.4 with one degree of freedom proved to be insignificant at the .05 level. The null hypothesis that the attitude of the female students to keep things neat makes no difference toward the student's tendency to study in industrial arts was accepted.

TABLE XI

PERSONAL ATTITUDE TOWARD THE
TRADITIONAL ROLE, SET I

Attitude Concerning Neatness	Group A		Group B	
	frequency	percent	frequency	percent
Agree	39	24.5	47	34.3
Disagree	120	75.5	90	65.7
Total	159	100.0	137	100.0

Chi-square = 3.4

χ^2 at .05 level = 3.841

Planning Attitude

Table XII presents an analysis of data related to the tendency of planning ahead. The comparison of percentages of the two group was opposite to the data of Table XI. The students of 94.3 percent in group A and 87.7 percent in group B do things planning ahead.

A chi-square value of 3.96 was found to be significant at the .05 level. Therefore, the null hypothesis which states that planning ahead makes no difference in her tendency to study in industrial arts was rejected.

TABLE XII
PERSONAL ATTITUDE TOWARD THE
TRADITIONAL ROLE, SET II

Planning Ahead	Group A		Group B	
	frequency	percent	frequency	percent
Positive	148	94.3	121	87.7
Negative	9	5.7	17	12.3
Total	157	100.0	138	100.0

Chi-Square = 3.96

χ^2 at .05 level = 3.841

A Female Shop Teacher

Table XIII shows the data of analysis of the student's attitude to

a female shop teacher. The comparison of two groups was not quite similar. Ninety-eight point one percent and ninety-two point eight percent in group A and group B, respectively, agreed with the concept of a girl as a shop teacher.

A chi-square value of 4.91 with one degree of freedom was found to be significant at the .05 level. Therefore, the null hypothesis that the student's attitude toward the girl to be a shop teacher makes no difference in the student's tendency to study in industrial arts was rejected.

TABLE XIII
PERSONAL ATTITUDE TOWARD THE
TRADITIONAL ROLE, SET III

A Female Shop Teacher	Group A		Group B	
	frequency	percent	frequency	percent
Agree	153	98.1	128	92.8
Disagree	3	1.9	10	7.2
Total	156	100.0	139	100.0

Chi-square - 4.91 χ^2 at .05 level = 3.841

Industrial Experience

Experience Working on Machines

Table XIV presents the analysis of data related to the student's working experience on machines. There are approximately over two-thirds of the girl students who have never worked on a machine. Thirty-four point eight percent of the students in group A and 18.6 of group B have experience working on machines.

Yield of a chi-square value of 4.91 with one degree of freedom was judged significant at the .05 level. Therefore, the null hypothesis that the student's industrial experience makes no difference on the student's tendency to study in industrial arts was rejected.

TABLE XIV
INDUSTRIAL EXPERIENCE

Experience of Working on Machines	Group A		Group B	
	frequency	percent	frequency	percent
Worked on Machines	55	34.8	26	18.6
Have Not Worked on Machines	103	65.2	114	81.4
Total	158	100.0	140	100.0

Chi-square = 9.89

χ^2 at .05 level = 3.841

Arts, Activities, Subjects and Literature Preference

Arts

An analysis of arts liked by the students in relation to their interest in industrial arts is presented in Table XV. Percentage comparison between the two groups proved to be closely similar in most cases. Thirty-two point nine and twenty-six point four percent in group A and group B, respectively liked ceramics. Twenty-four point one and twenty-four point nine percent in group A and group B, respectively, liked photography. Twenty point eight and twenty-four point two percent in group A and group B liked decoupage, respectively. Eleven point one and thirteen point four percent in group A and group B, respectively, liked silk-screen printing.

A chi-square value of 3.51 with five degrees of freedom was found to be insignificant at the .05 level. Therefore, the null hypothesis that the type arts the students liked makes no difference on her tendency to study in industrial arts was accepted.

Activities

Table XVI presents an analysis of data pertaining to favorite activities for the student. The largest percentage found were in relation to motor cycle riding (30.7 and 31.0 percent of group A and group B, respectively) while 28.0 and 29.6 percent of the group A and group B, respectively, liked playing pool. All other areas were similar in two groups.

TABLE XV
ARTS, ACTIVITIES, SUBJECTS AND LITERATURE
PREFERENCE, SET I

Arts	Group A		Group B	
	frequency	percent	frequency	percent
Silk-screen printing	34	11.1	36	13.4
Block printing	15	11.1	12	4.4
Decoupage	64	20.8	65	24.4
Ceramics	101	32.9	71	26.4
Plastics modeling	19	6.2	18	6.7
Photography	74	24.1	67	24.9
Total	307	100.0	269	100.0

Chi-square = 3.51

χ^2 at .05 level = 11.07

Yield of a chi-square value of 3.51 with six degrees of freedom was found to be significant at the .05 level for this set of activities in comparison to student's industrial arts tendency. The null hypothesis that the type activities the students liked makes no difference on her tendency to study in industrial arts was rejected.

TABLE XVI
ARTS, ACTIVITIES, SUBJECTS AND LITERATURE
PREFERENCE, SET II

Activities	Group A		Group B	
	frequency	percent	frequency	percent
Riding motorcycle	79	30.7	67	31.0
Playing basketball	62	24.1	61	28.2
Go hunting	30	11.7	11	5.1
Playing chess	14	5.5	13	6.1
Playing pool	72	28.0	64	29.6
Total	257	100.0	216	100.0

Chi-square = 6.8

χ^2 at .05 level = 9.488

Subjects

Table XVII presents data analyzed in relation of subjects of Math and Science, and other subjects including Music, Home Economics, History, English, Physical Education, Art, Foreign Language, Speech. Twenty point two percent of group A and fourteen point three percent of group B liked Math and Science.

However, a chi-square value of 5.06 with one degree of freedom was found to be significant at the .05 level. The null hypothesis that the type subject the student liked makes no difference on student's tendency to study in industrial arts was rejected.

TABLE XVII
ARTS, ACTIVITIES, SUBJECTS AND LITERATURE
PREFERENCE, SET III

Subjects	Group A		Group B	
	frequency	percent	frequency	percent
Math and Science	102	20.2	67	14.3
Others	414	79.8	400	85.7
Total	516	100.0	467	100.0

Chi-square = 5.06 χ^2 at .05 level = 3.841

Literature Preference

An analysis of data representing the student's favorite magazine related to industrial arts; 60.8 and 56.6 percent of group A and group B, respectively, read the industrial arts magazine.

A chi-square value of .52 with one degree of freedom was judged insignificant at the .05 level. Because of this, the null hypothesis that the type magazine a student liked makes no difference on her tendency to study in industrial arts was accepted.

TABLE XVIII
ARTS, ACTIVITIES, SUBJECTS AND LITERATURE
PREFERENCE, SET IV

Magazines	Group A		Group B	
	frequency	percent	frequency	percent
Related to Industrial Arts	96	60.8	77	56.6
Not Related to Industrial Arts	62	39.2	59	43.4
Total	158	100.0	136	100.0

Chi-square = 0.52 χ^2 at .05 level = 3.841

Analyses of Factors Which Are Influential in
Student's Attitude Toward Industrial Arts

Factors of Making Good Grades

The student's good grades might be caused by studying hard, interest in the subject and good teaching or luck. Table XIX presented the percentage of the factors. Interest in the subject was reported by over half of total population (61.1 percent).

Factors Which Influenced the Female Students

Dislike the Machine

Table XX shows the student's dislike for working on machines. Slightly less than the half (43.7 percent) indicated that industrial

arts was not related to their selection of a future career; 27.7 percent reported insufficient knowledge.

TABLE XIX
MAKING GOOD GRADE

Factors	Frequency	Percent
Study Hard	57	19.8
Interest in the Subject	176	61.1
Good Teacher	34	11.8
Luck	21	7.3
Total	288	100.0

TABLE XX
FEMALE STUDENTS DISLIKE MACHINE WORK

Factors	Frequency	Percent
Dirty	16	7.8
Noisy	25	12.1
Insufficient Knowledge	57	27.7
Not Related to Future Career	90	43.7
Others	18	8.7
Total	206	100.0

Factors of the Students Lack of Experience
on Machines

Table XXI presents the percentage of the different reasons which might be responsible for attitude of female students toward industrial arts. A large percentage (35.4 percent) of the students have had no opportunity to work in the shop. Another 35.4 percent of the female students do not have sufficient knowledge of industrial arts. Thirteen point one percent of the students need assistance. Eleven percent think that it is a male's job. Only a small percentage of students think that it is dangerous. Only 2.7 percent have been prohibited from taking industrial arts by their parents.

TABLE XXI
STUDENTS LACK OF EXPERIENCE ON MACHINES

Factors	Frequency	Percent
Dangerous	21	5.6
Noisy	16	4.3
Dirty	14	3.8
No Working Opportunity	132	35.4
Knowledge Insufficient	90	24.1
No Assistance Available	49	13.1
Parents Prohibited	10	2.7
Not Fit to Female	41	11.0
Total	373	100.0

Attitude Toward Working in Shop

Table XXII presents the female student's attitude toward working in shop. Only 30.6 percent like to try to work in the shop independently. The large percentage (49.4 and 12.8 percent, totally) would like to work in shop with teacher's or male student's assistance. Only small percentage (2.3 percent) avoided to work in shop, and 2.9 percent of the students think they can't make it even with teacher's help.

TABLE XXII
ATTITUDE TOWARD WORKING IN SHOP

Attitude	Frequency	Percent
Working Independently		
Read Related Books First	28	10.6
Discuss with Teacher First	53	20.0
Trying with the Assistance		
Teacher's Assistance	131	49.4
Male Classmate's Assistance	34	12.8
Avoided To Do	6	2.3
Do Not Make It Even with Help	13	4.9
Total	265	100.0

Personal Opinion Toward A Female Shop Teacher

According to Table XXIII, 13 out of 294 students disagree female to be a shop teacher. Thirty-eight point five percent think the job doesn't fit to female. Another 38.5 percent of students think female shop teachers do not have strong technical and knowledge background.

TABLE XXIII
PERSONAL OPINION TOWARD A FEMALE SHOP TEACHER

Factors	Frequency	Percent
Not Fit to Female	5	38.5
Do Not Have Strong Background	5	38.5
Not Strong Enough to Operate Machines	3	23.0
Total	13	100.0

Two hundred and twenty-one out of total students (294) which based on Table XXIII recommended the female to be a shop teacher was including in terms of: (1) No sexual discrimination, (2) Equal employment, (3) Equal intelligence, (4) Equal learning opportunity.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Presented in this chapter is a summary review of the design of the study and of the major findings. Also presented are conclusions and recommendations based upon the analysis and summarization of the data collected.

Summary

Purpose of the Study

The purpose of this study was determine if there are differences in selected factors which could influence a junior high school female student to study in industrial arts.

The following were formulated to accomplish the major purpose of the study:

1. To compare the family background to the student's tendency to study in industrial arts.
2. To compare repair experience to the student's tendency to study in industrial arts.
3. To compare scholastic inventory to the student's to study in industrial arts.
4. To compare personal attitude toward the traditional role to the student's tendency in industrial arts.
5. To compare working experience in industrial shop to the student's tendency to study in industrial arts.
6. To compare career selection to the student's tendency to study in industrial arts.

7. To compare the type arts, activities, subjects, and literature preference that the student liked to the student's tendency to study in industrial arts.

Need for the Study

Following a review of the literature, the selection of a study population, developing an instrument for collection of data, and collection and an analysis of data were the major tasks involved in the design and conduct of the study.

The study samples consisted of 313 seventh and eighth grade female students. The questionnaire which was administered to students by the researcher and other two OSU students.

Summary of Findings

The findings of the study have been presented in terms of seven objectives which were formulated to provide direction to the study. Null hypotheses were tested in relation to the objectives of the study.

Objective I. To compare the family background to the student's tendency to study in industrial arts.

The analysis of data which collected from the terms of father's and mother's occupations, and an older brother in family revealed that it was insignificant as measured by chi-square test of goodness of fit.

Objective II. To compare repair experience to the student's tendency to study in industrial arts.

The student's minor repair experience makes no difference on her tendency to study in industrial arts. However, the student's tendency to repair her own equipment was significant to the student's tendency to study in industrial arts.

Objective III. To compare scholastic inventory to the student's tendency to study in industrial arts,

Analysis of data comparing scholastic inventory to the student's tendency in industrial arts was found insignificant.

Objective IV. To compare personal attitude toward the traditional role to the student's tendency to study in industrial arts.

The analysis of data which divided by three subjects: the attitude concerned neatness makes no difference toward the student's tendency to study in industrial arts. The student's planning ahead and the student's attitude toward a female shop teacher is significant in the student's tendency to study in industrial arts.

Objective V. To compare working experience in industrial shop to the student's tendency to study in industrial arts.

The analyzed data revealed that the student's industrial experience is significant to the student's tendency to study in industrial arts.

Objective VI. To compare career selection to the student's tendency to study in industrial arts.

The student thinks the jobs related to industrial arts are available for girls in today's society makes insignificance on the student's tendency to study in industrial arts. The type of career selection makes no difference to the student's tendency to study in industrial arts was rejected.

Objective VII. To compare the type arts, activities, subjects, and literature preference to the student's tendency to study in industrial arts.

The comparison of four terms that the type activities and subjects

make difference to the student's tendency to study in industrial arts. The type arts and literature preference makes no difference on the student's tendency to study in industrial arts.

Conclusions

Based on the findings of this study and the data analysis of the many factors which might caused the findings, the following conclusions were drawn:

Family background, minor repair experience, scholastic inventory, attitude toward neatness, attitude toward the today's jobs offered for the girls in industrial arts area, and the type arts and literature preference make no difference on the student's tendency to study in industrial arts.

Student's tendency toward repairing her own equipment, planning ahead, attitude toward the female shop teacher, industrial experience, the future career selection, and activities and subjects enjoyed are significantly related to the girl student's tendency to study in industrial arts.

Most of the junior high female students have not had shop working experience, and confessed that they have not had an opportunity to work on machines, and also have not had enough technical knowledge. However, they would like to try if assistance is available. Only a few girls would avoid trying. The female students studying industrial arts need to be encouraged, and in the meantime, need assistance to make up for their weak background.

Recommendations

In light of the findings and conclusions, the following general

recommendations are offered:

Recommendation I: Future Studies

1. This study should be repeated periodically to ascertain if perceptions and conditions have changed.
2. The present study should be continued for a second year in order to detect differential effects of curriculum and school guidance on the students.
3. The same study should be applied to the male students on the same level to compare the student's studying tendency on both sexes.

Recommendation II: A Woman Shop Teacher

1. Junior high schools should provide future female educators with a basis on which to build a high level of career aspirations.
2. Junior high schools should consider employing the female shop teacher as a student's future career model.
3. Female shop teachers should have opportunity to participate in decision-making processes in industrial arts programs.

Recommendation III: School Counseling

1. The counseling service should provide television and strip films to introduce the field of industrial arts.
2. The removal of artificial restrictions which hold that some jobs are masculine while others are feminine.
3. The counseling in school should provide field trips for female students to visit industry, because industrial jobs must be considered as the future field of employment for both sexes.
4. The school counselors should promote awareness of the potential

of female students in industrial arts.

Recommendation IV: The Attitude of Industry

All industrial workers and management should encourage the young girl with an interest in industrial arts to consider entering industry.

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APPENDIX

10. Which kinds of art work do you most enjoy doing or attempting?
(select four)
- | | |
|-------------------------|----------------------|
| a. watercolor painting | f. ceramics |
| b. oil painting | g. plastics modeling |
| c. silk-screen painting | h. photography |
| d. block printing | i. pencil sketching |
| e. decoupage | j. textile weaving |
11. Do you like to plan ahead before you do things?
- | | |
|--------|-------|
| a. Yes | b. No |
|--------|-------|
12. What is or was your grade average in Math?
- | | | | | |
|---|---|---|---|---|
| A | B | C | D | F |
|---|---|---|---|---|
13. What is or was your grade average in Science?
- | | | | | |
|---|---|---|---|---|
| A | B | C | D | F |
|---|---|---|---|---|
14. If you have a good grade in a specific field, do you think it is because:
- you study hard
 - you are interested in the subject matter
 - you have a good teacher
 - you were lucky.
15. Have you ever worked on machines in the shop?
- | | |
|--------|-------|
| a. Yes | b. No |
|--------|-------|
16. If the last answer was No, it is because: (select as many as appropriate)
- it is dangerous
 - it is noisy
 - no opportunity
 - it is dirty
 - insufficient knowledge about the machine and operation
 - no one available to help you operate machine
 - your parents will not allow you to touch machines
 - it seems to be a boy's job, not fit for girls.
17. If you were given the opportunity to make wooden shoes in shop, would you:
- like to try with the teacher's assistance
 - not make it even with the teacher's help
 - read related books before starting, and then make the working procedure independently
 - discuss it with the teacher first, and then do it yourself
 - avoid doing it yourself if possible
 - let a male classmate help you as much as possible.
18. Which of the following sports or activities would you like to do or try: (select four)
- | | |
|-----------------------|------------------|
| a. riding motorcycle | f. playing pool |
| b. riding bicycle | g. playing cards |
| c. playing basketball | h. sewing |
| d. go hunting | i. cooking |
| e. playing chess | j. watching TV |
19. If your bicycle broke, would you like to:
- | | |
|-----------------------|-----------------------------------|
| a. repair it yourself | b. take it to shop to have fixed. |
|-----------------------|-----------------------------------|

20. What are your favorite magazines? (select four)
- | | |
|----------------------------|-----------------------------|
| a. Sports Illustrated | f. Model Airplane News |
| b. Seventeen | g. Popular Mechanics |
| c. Electronics Illustrated | h. Science World |
| d. Rolling Stone | i. Creative Crafts Magazine |
| e. Art and Man | j. Saturday Review |
21. What kinds of jobs do you think you would like? (select four)
- | | |
|---------------------------|-------------------------------|
| a. home economics teacher | f. social worker |
| b. nurse | g. dentist |
| c. engineer | h. artist |
| d. reporter | i. physical education teacher |
| e. secretary | j. laboratory technician |
22. Do you think a girl should be permitted to become a shop teacher?
- | | |
|--------|-------|
| a. Yes | b. No |
|--------|-------|
23. Why:
-
-

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