AN ANALYSIS OF MALE-FEMALE ENROLLMENT TRENDS

IN OKLAHOMA VOCATIONAL EDUCATION PROGRAMS

DURING THE PERIOD 1972-1979

By<br>MOHAMMAD KHALIL-UR REHMAN<br>Bachelor of Arts<br>University of the Panjab<br>Lahore, Pakistan<br>1970

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Thesis Approved:


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## CHAPTER I

## INTRODUCTION

Sexism has been defined as "a limiting role for either sex" and in the wake of the "women's movement" of the 1960's and 1970's it has emerged as an issue in American education. While addressing the organizational meeting of the Subtask Force on Sex Role Stereotyping in the schools, Thompson (1976) stated:

We treat women and men differently in our society; all societies do and always have. There are historically understandable reasons based on biological and physiological differences, the child-bearing function of the female and the greater physical strength of the male. Now, however, it is widely recognized that in a developed, technological society like ours those characteristics do not justify the extent of the differences in treatment which still prevails. Persuasive arguments have been made that the attitudes and practices which polarize women and men and exaggerate their differences result in a denial of opportunity to both sexes and create especially difficult problems in a country where equality has always been a national goal --simple justice requires us to put an end to sex role stereotyping (p. 3).

Concerns over sex role stereotyping have stimulated efforts all
over the Country to reduce the different treatment of women and men to justifiable instances. As indicated by Thompson (1976), we of the late twentieth century, are living in quite a different age than the previous one in which families needed many children and "muscle-power" was the prime source of energy. In today's age, differences between the sexes relative to occupational interests and pursuits do not matter. Sex difference rarely matters to one's educability, job per-
formance, political ability, recreational needs or most roles of responsibility within the family.

Many federal rules, regulations, acts, and subsequent amendments have shown concern with this problem. Most have recommended certain steps to provide equal opportunities for citizens in order to avoid discrimination in employment and education. The following list includes some of the laws and executive orders which address opportunity:
. Age Discrimination Employment Act
. Civil Rights Act of 1964, Title VII
. Education Amendments of 1972, Tit1e IX
. Education Amendments of 1976, Title II
. Equal Pay Act of 1963
. Executive Order 11246, Amended by 11375
. Executive Order 11478
. National Labor Relations Act
. Regualtions of the Bureau of Apprenticeship and Training
. Women's Educational Equity Act of 1974
The Education Amendments of 1976 refer directly to this problem. These amendments mandate that a study be made of the extent of sex discrimination and sex stereotyping in vocational education. They require that efforts toward reducing sex discrimination and sex stereotyping both in training programs and in the occupations to which they lead be monitored by state agencies. Some of the positive actions required by these amendments to reduce sex stereotyping and discrimination in vocational education programs were aggregated by Harrison (1978):
a. Taking action to create awareness of vocational education programs and activities designed to reduce sex stereotyping, in all fields;
b. Gathering, analyzing, and disseminating data on the status of men and women students and employees in vocational education programs in the States;
c. Developing and supporting actions to correct problems uncovered through the operation of $b$ above;
d. Reviewing grant distribution by the State board to assure that the needs and interests of women are considered in projects benefited under the Act;
e. Reviewing all the State's vocational education programs for sex bias;
f. Monitoring the implimentation of Law prohibiting sex discrimination in all of the State's hiring, firing, and promotion procedures regarding vocational education;
g. Reviewing and providing recommendations regarding the overcoming of sex stereotyping and sex bias in vocational education programs for the annual program plan and report;
h. Assisting LEA's and others in improving vocational education opportunities for women; and,
i. Making available to a number of specified agencies and councils, the Commissioner of Education, and the general public, information developed pursuant to the activities listed above (p. 3).

One of the reasons which led Congress to pass such laws and to include such specific provisions in the amendments was a report submitted to the nincty-fourth Congress of the United States, Subcommittee on Education and Labor (1975). This report presented findings of the subcommittee of the status of women in vocational education, the enforcement provisions of anti-discrimination legislation, and the results of a recently completed civil rights survey. A detailed research report entitled "Women in Vocational Education" was appended. That report examined the status of women in the world of work, sexism in society and education, and related problems for women in education.

Concerns of thls report are reflected in the Vocational Amendments of 1976, Public Law 94-482, which were signed into law on October 12,
1976. Title II of P.L. $94-482$ is a major revision of the Vocational Amendments of 1968. This Title is concerned with furnishing equal educational opportunities in vocational education programs to persons of both sexes and with eliminating sex discrimination and sex stereotyping from all vocational programs. Title II mandates each state to reserve $\$ 50,000$ each fiscal year for supporting the employment of full-time personnel to assist the State Board for Vocational Education in fulfilling these purposes of the Act.

## Statement of the Problem

Though steps have been taken to eliminate sex role stereotyping and sex discrimination from vocational education programs in Oklahoma, little information has been available to determine the success of such efforts. Data to indicate changes in sex distribution among the State's vocational enrollments since these efforts were initiated have been heretofore nonexistent.

## Need for the Study

In addition to the above-mentioned federal legislation requirement for evaluating vocational programs to determine progress being made toward reducing sex discrimination and sex stereotyping, a special request was made by the State Department of Vocational and Technical Education (1978), asking for the following specific information:

Review the status of programs in overcoming sex bias and sex stereotyping in vocational education programs for the annual plan and accountability report.- - - Analyze enrollment data. Compare the base data of 1977 and make recommendations.- - the equity staff is requesting a statistical analysis be completed in FY 79 which will provide a complete analysis of the data (p. 197).

The above-mentioned request gave rise to this specific study and cooperation has been provided by the Oklahoma State Department of Vocational and Technical Education for conducting the research. Moreover, the U.S. Office of Education stressed the need to show tangible results rather than merely activities and policies in regard to the elimination of sex bias and sex stereotyping in the State Plan and Accountability Reports (Cornelson, 1979).

Purpose of the Study

The purpose of this study was to determine whether or not a statistically significant change in the sex distribution of enrollments in programs of vocational education in Oklahoma has occured since the educational equity operation was initiated.

Hypotheses

1. There is no statistically significant difference in sex distribution in vocational programs when enrollments before and after 1976 are compared.
2. There is no statistically significant difference in sex distribution in the specific program areas listed in Table II when enrollments before and after 1976 are compared.
3. A. There is no statistically significant difference in sex distribution in Area Vocational Technical School programs when enrollments before and after 1976 are compared.
4. B. There is no statistically significant difference in sex distribution in comprehensive high school vocational
programs when enrollments before and after 1976 are compared.
5. A. 1. There is no statistically significant difference in sex distribution of enrollments in traditionally male-oriented programs located in urban areas.
6. A. 2. There is no statistically significant difference in sex distribution of enrollments in traditionally male-oriented pro-: grams located in sulturban areas.
7. A. 3. There is no statistically significant difference in traditionally male-oriented vocational programs located in rural areas when enrollments before and after 1976 are compared.
8. B. 1. There is no statistically significant difference in sex distribution of enrollments in traditionally female-oriented vocational programs in urban areas.
9. B. 2. There is no statistically significant difference in sex distribution of enrollments in traditionally female-oriented vocational programs located in suburban areas.
10. B. 3. There is no statistically significant difference in sex distribution of enrollments in traditionally female-oriented vocational programs located in rural areas.
11. A. There is no statistically significant difference in sex distribution in secondary school vocational programs when enrollments before and after 1976 are compared.
12. B. There is no statistically significant difference in sex distribution in full-time adult vocational programs when enrollments before and after 1976 are compared.

## Definition of Terms

Traditional Programs: Programs, which have historically been dominated by one sex or another. For an example, auto mechanics may, traditionally, have been dominated by males and cosmetology, by females.

Sex Stereotyping: Having some characteristics associated with one sex or the other.

Sex Bias: The tendency to strongly associate certain behavioral characteristics to one sex or another.

AVTS Programs: Area vocational technical school (AVTS) programs operated in Oklahoma are those which offer only vocational-technical programs at secondary and adult level.

Secondary Programs: Those programs which enroll full-time students in grades 9, 10, 11, and 12.

Adult Programs: Programs operated for persons no longer enrolled in secondary schools.

Comprehensive High School: A school offering all forms of secondary education including vocatioanl-technical, general education and others, at secondary level.

Urban Schools: Schools located in big cities where the population was estimated to be over 60,000. The cities included in this category were: Oklahoma City, Tulsa, Lawton and Norman.

Suburban Schools: Schools located in small cities where the population was estimated to be less than 60,000 but more than 10,000 . The towns included in this category were: Midwest City, Enid, Muskogee, Stillwater, Shawnee, Del City, Bartlesville, Ponca City, Enid, Muskogee, Moore, Ardmore, Bethany, Duncan, McAlester, Broken Arrow, Ada, Chickasha, Okmulgee, Sapula, El Reno, Miami, Yukon, Sand Springs, and Durant.

Rural Schools: Schools located in small towns where the population was estimated to be less than 10,000 . The rest of the schools which were not listed in above-mentioned two categories were defined as rural schools.

Majority Students (sex): Female students enrolled in traditionally female-oriented programs as classified in Appendix D, are known to be majority students in that program. Similarly the male students enrolled in traditionally male-oriented programs are classified as majority students.

Minority Students (sex): Male students enrolled in female-oriented programs listed in Appendix D, are classified as minority students. Simflarly, the female students enrolled in male-oriented programs are clas sified as minority students.

CHAPTER II

## REVIEW OF RELATED LITERATURE

This Chapter presents and describes information from the literature related to this study. The purpose of the study was to determine whether a significant change has occured in the sex distribution of enrollments in Oklahoma's vocational education programs since the move toward educational equity was initiated. Moreover, some background information on education equity is presented and relative to various aspects of the State and Federal requirements. The majority of this law, other related laws, and implications for the future of vocational education.

## Identification of the Need

Factors Which Led to P.L. 94-482

Harrison (1978) summarized the factors which led Congress to include specifications in the amendments for sex equity in education. The author writes that the problems of sex discrimination and stereotyping in vocational education and in hiring and promotion policies in the labor force have been pointed out repeatedly. This was especially true during the hearings before the House Subcommittee on Elementary, Secondary, and Vocational Education in March, 1975. Some of the factors are listed and described in the following paragraphs.

Increase in Numbers of. Working Women

The above mentioned author calculates that between 1950 and 1978 the number of working women increased by 117 percent. Moreover, there was a large increase in the percentage of working married women and those with small children.

According to Harrison (1958), the percentage of unmarried women has; increased also, due in part to the fact that there are unmarried women. The number of women heads of households increased from 1 to 10 in 1966 to 1 in 8 in 1978. The proportion for this group would be 1 in 7 by 1980 .

In addition to the economic factors, the increased number of working women is due partially to a decline in the national birth rate which has freed some women from the responsibilities of motherhood. Other factors which may account for today's greater number of working women is their higher levels of education and greater interest in the challenge and responsibility of a career.

The lower earnings of women according to Harrison (1978), also has caused concern and promoted the passage of equal opportunity laws. It was estimated that an average, fully-employed women earns approximately $\$ 6$ for every $\$ 10$ earned by her male counterpart and that such a lag exists in virtually all occupational groups. In 1955, fully employed women earned an average of 64 percent as much as fully employed men; by 1974 that percentage had dropped to 57. In 1973, the median salary for men was 11,186 ; for women it was $\$ 5,772$.

The reason given by Harrison (1978) for this gap was simply unequal pay for the same work. However, much of the difference was due to the low paying jobs in which most women work. Men worked in a wide variety of occupations; less than 20 percent fit into the ten leading categories of predominately male occupations. By comparison, over 40 percent of the Nation's women work in occupations dominated by females, and in 17 of the leading female occupations, women account for over 90 percent of the employees.

As stated by Harrison (1978), women are heavily represented in lower paying jobs, men in higher paying ones like sales, health, and engineering. In retail trade, most women are clerks; few work in wholesale or management positions; and men earn, on the average, 65 percent more money. More women than men wind up in "semi-professional" positions such as social worker and teacher, but far fewer in high-status, high-paying professions such as law, medicine and engineering.

## Results, Methodology and Research Instruments

Kerlinger (1973) suggests, while describing methodology-data collection in research reports, the following steps may be included:

1. Sample and sampling method
2. How hypotheses were tested (methodology), experimental procedures, instrumentation
3. Measurement of variables
4. Methods of analysis, statistics
5. Pretesting and pilot studies

In review of literature the emphasis was placed on few of the above mentioned steps.

## Educational Comparison

In comparing educational attainment of women with men, women are not now less educated. As stated by Harrison (1978), the average years of schooling in 1973 was 12.1 for women compared with 12.0 for men. In 1964, women accounted for 38 percent of college student; in 1977 the figure edged over 50 percent. Nevertheless, women at every educational level earn less than men; only at the graduate degree level do they come even within 60 percent of men's earnings. In 1972, the average female college graduate earned $\$ 8,736$ per year; the average male high school graduate earned $\$ 11,073$.

A question was raised by Harrison (1978), to find if there were any exception to such patterns. Then the matter was responded that the exception to this pattern was the group of women which had pursued traditionally male dominated careers. It was further stated that while the number of women following this course was increasing, there were still few. Between 1960 and 1970, the number of women lawyers rose from seven percent to nine percent. For machinists, the number went from 1.3 percent to 3.1 percent. In 1947 , only 1.6 percent of all female workers were employed in crafts and kindred jobs.

## Women and Vocational Education

According to Harrison (1978), though women are slightly over half of vocational education students, they study traditionally female-oriented, low paying occupations. Forty-two percent were studying homemakIng and consumer education courses while 20 percent were preparing for office work related courses (mostly secretarial and clerical). In the fields of health, 92 percent of the students in health and paramedical technology (including dental hygiene and nursing) were women; they con-
stituted only 14 percent of those in mechanical and engineering technology.

According to Harrison (1978), the point is not that these discrepencies are the fault of vocational education. Even college women chose traditional roles disproportionately. In 1971 only 6.5 percent of col: lege women were preparing for nontraditional careers. Thirty-six percent were earning B.A.'s in education, 2.9 percent in business and management, 0.8 percent in physical sciences. Vocational education is no better or worse than the rest of socity. Women bring to their career decisions a long chain of influence and socialization contributed to by parents, peers, the media, teachers, counselors and various other sources.

The clustering of men and women into separate occupations, according to Harrison (1978), is definitely a limitation to women. It was further stated that such clustering was a limitation to men as well. It was because of these reasons, that the new legislation was concerned that equal access to all training programs be provided and encouraged for men and women. It was further suggested by Harrison that the choice for vocational education was either to perpetuate the stereotyping and resultant inequalities, or to play an active role of support and encouragement in fostering equal access to all occupations for which vocational students train. This opportunity for vocational education was said to be a decisive one to make genuine impact on a situation that had long been in need of correction.

What Does P.L. 94-482 Include?

The Vocational Education Amendments of 1976, Public Law 94-482, was signed into law on October 12, 1976. Title II of P.L. 94-482 is a major
revision of the Vocational Education Amendments of 1968. This title is concerned with furnishing equal educational opportunities in vocational education programs to persons of both sexes and eliminating sex discrimination and sex stereotyping from all vocational programs.

The State Department of Vocational and Technical Education (1979), in its Oklahoma Annual State Plan for 1979 , included a special section under the title of "Policies for Eliminating Sex Discrimination", which stated:

The Oklahoma State Department of Vocational and Technical Education shall provide equal educational opportunities in vocational education programs to persons of both sexes and eliminate sex bias and sex stereotyping from all vocational education programs (p. 83).

Subsection 1 of section $G$ of the 1979 plan provides the guidelines for eliminating such bias and stereotyping.
G. Review the status of programs in overcoming sex bias and sex stereotyping in vocational education programs for the annual plan and accountability report. --- Analyze enrollment data. Compare the base data of FY 77 and make recommendations (p. 85).

The state agencies also are obligated to eliminate sex bias and reduce sex stereotyping in all vocational programs. The following functions and responsibilities are to cooperate and coordinate with federal efforts to overcome this problem.

The functions which Oklahoma State Department of Vocational and Technical Education (1979) implemented for FY 1979, were mentioned in its Annual Accountibility Report of 1979, included:
A. Taking such action as may be necessary to create awareness of programs and activities in vocational education that are designed to reduce sex stereotyping in all vocational education programs;
B. Gathering, analyzing, and disseminating data on the status of men and women, students and employees in the vocational education programs of the state;
C. Developing and supporting actions to correct any problems brought to the attention of such personnel through activities carried out under clause (B) of this sentence;
D. Reviewing the distribution of grants by the State Board to assure that the interests and needs of women are addressed in the projects assisted under this act;
E. Reviewing all vocational education programs in the State for sex bias;
F. Monitoring the implementation of laws prohibiting sex discrimination in all hiring, firing, and promotion procedures within the State relating to vocational education;
G. Reviewing and submitting recommendations with respect to the overcoming of sex stereotyping and sex bias in vocational education programs for the annual program plan and report;
H. Assisting local educational agencies and other interested parties in the state in improving vocational education opportunities for women;
I. Making readily available to the State Board, the State and National Advisory Councils on Vocational Education, the State Commission on the Status of Women, the Commissioner and the general public, information developed pursuant to this subsection (p. 2).

During the hearing before the subcommittee on post secondary education of the Committee on Education and Labor, House of Representatives, Ninety Fourth Congress of the United States (1975), many complaints were filed against sex discrimination practices. The different methods used for showing sex discrimination against women in some of the complaints filed included the following:

Complaints filed by the student government of the University of Minnisota against sex discrimination practiced by the University nolicies included descriptive statements by comparing financial aid provided to both sexes, including sports facilities in swimming, track, tennis, gym, nastics and in other sports. Moreover, other comparisons were made in enrollments, facilities, uniforms, travel benefits, financial aid, other
awards, coaches' salary and official benifits. The enrollments of both sexes were compared for every college.

A research study conducted in Illinois by the State Department of Education (1977), used different methods for comparing sex distribution among administrators, teachers and students. An analysis was made of the number of male and female administrators for the purpose of eliminating any discrimination in employment (recruitment, hiring, placement, and promotion of educational personnel) in the state's public elementary and secondary schools. The numbers and percentages of certificated, full-time administrative personnel, by position and sex, were compared during the period 1968-1977. For this time span, a percentage sex distribution goal was established for each administrative level in the system. The percentage was derived from an analysis of the total population strength for both sexes.

In the same study, evidence of sex discrimination in the Illinois vocational education programs was presented through a comparison of 1972/1976, male/female enrollments in vocational education. Fields of vocational education included in the study were agriculture, distributive education, health, home-making/consumer, gainful home economics, office, technical, and trade industry education.

## Some Techniques Used in Evaluation

There are various kinds of the designs of evaluating systems. In every situation the specific design can be selected according to the needs of training organizations. No design, of course, will be universal for all situations. Lawson and Wentling (1975) suggest that several techniques can be combined to build a system of evaluation. The techniques mentioned
include learner assessment, the follow-up of former learners, the employer survey, the consultative team evaluation, the evaluation of education and training personnel, and the cost-related evaluation.

Learner Assessment: Sometimes, though it is desirable to have the coordinator, or another trained observer make his own appraisal of the program, yet the measurement of learner performance according to Lawson and Wentling (1975), is probably the most wlaely used evaluation technique. The competencies desired at the end of the program are indicated in the objectives of the program. The measurement of these competencies is the central focus of the evaluation. These competencies, according to Lawson and Wentling (1975), fall within the cognitive, affective, psychomotor, or perceptual domains. Many types of instruments were suggested to be utilized to measure student performance---paper and pencil, attitude scales, project or product ratings, and presentation ratings.

The Follow-up of Former Learners: A follow-up study involves contacting individuals subsequent to their participation in an education or training program. For vocational programs in certain states, maintaining such records is mandated by law. This contact as indicated by Lawson and Wentling (1975), can provide placement information as well as other information relating to the post-program activities of the graduate dropout. This method provides the opportunities to utilize the former learners suggestions for improvement by asking their perception of the training program's strengths and weaknesses.

The Employer Survey: If one is going to evaluate a vocational program, according to Lawson and Wentling (1975), an employer survey, usually obtained through mail, can provide yet another vantage point to learner performance. The questionnaires or rating forms are the traditional
instruments for this kind of survey. The programs's strengths and weaknesses can be identified by integrating the information about the same body of learners obtained through the utilization of student measurement, student follow-up, and employer survey.

The Evaluation of Education and Training Personnel: The importance of the assessment of personnel performance was recognized by Lawson and Wentling (1975). The contribution of assessment of personnel performance to the success of a program narrated by these authors appears as under:

Many times the evaluation of faculty is thought of only in terms of tenure, promotion, or meeting a governing board mandate. However, personnel performance is probably the most important contributor to the success of a program. Although the assessment of faculty and other personnnel has traditionally been accomplished through observation and rating by a superior, evaluation through observation by peers, self-observation by way of video tape, rating by siudents, and the utilization of teacher performance tests can broaden the scope of faculty and ancillary personnel performance assessment (p. 34).

Specific deficiencies of staff members can be identified by such assessment; moreover, such assessment can be enormously helpful to make recommendations for remediation.

Cost Analysis Evaluation: A cost related evaluation further provides the strength to the above-mentioned techniques. A program may not be considered efficient if it does not qualify this standard. Lawson and Wentling (1975, p. 35) stated that, "Cost studies must attempt to correlate costs to outcomes, facilitating program decision making." In a time of financial constraints, the cost would be given enormous consideration in making a crucial decision of continuing or dropping a training program.

Training program evaluation techiques and methodology described in the reviewd literature were very interesting, relevant and helpful for
determining and designing the methodology for this study. Since intent of this study was to evaluate the effectiveness of the Educational equity Staff activities, it was deemed appropriate to review the techniques used for evaluating other programs.

During a study for evaluating the effectiveness of training methods, Newstrom (1980), developed a contingency approach. A questionnaire was developed which allowed respondents to rate the effectiveness of nine standard training methods for achieving each of six traịning objectives. The methods which were evaluated by Newstrom, include: case study, conference (discussion) method, lecture (with question), business games, movie films, programmed instruction, role playing, sensitivity training (T-groups and television lecture). The training objectives examined were an expansion of the basic trio of knowledge, skills and attitudes: knowledge acquisition, changing attitudes, problem solving skills,interpersonal skills, participant acceptance and knowledge retention.

Fifty-four usable questionnaires were completed for a return rate of 27 percent. For analyzing the results, the mean effectiveness of each method for each of the six training objectices was calculated. A rank order was developed from these means to describe the relative effectiveness of each method.

In the study described above, the assumption, "though one training director can not borrow evaluation results from another; he/she can, however, borrow evaluation techniques," (p. 78). Therefore, the results of the studies were not reported; rather, methods and instruments were described. Four program evaluation steps have been recognized and described by Kirkpatrick (1959a) which were very important and most common for evaluating training programs.

These four steps are:

1. Reaction
2. Learning
3. Behavior
4. Results

Evaluating Programs in Terms of Reaction: The measuring of reaction would be similar to findings of the conferees. "How well the trainees liked a particular training program" would be an appropriate definition for reaction. This technique of measurement has varied effects on decision-making about a training program. For maximum learning, one must have interest and enthusiasm for the program.

For measuring the reaction of the participants, it is recommended that written comment sheets be used which are designed to obtain the desired reaction. The important point for consideration would be designing the form in such a way that the comments can be tabulated and quantified. To implement the reaction of enrollee, it is also suggested to have the coordinator, training director or another trained observer make his own appraisal of the session. It usually is considered more meaningful to have the combination of these two evaluations than either one by itself.

Measurement of reaction, of course, does not provide any surety that any learning has taken place. Neither is there any assurance of any behavioral change, nor an indication of the results which can be attributed to the training program. But still the results of reaction measurements may have some effect on the decision for continuation or termination of the training program.

Evaluating Program in Terms of Learning: The next step in evaluation is, "Learning Step" which is much more difficult to measure than that of reaction to a program. What principles, facts, and techniques were understood and absorbed by the conferees? The limited scope of learning does not include on-the-job use of these principles, facts, and techniques.

Some suggestions were made by Kirkpatrick (1959b), to measure the learning of each conferee so that quantitative results can be determined. A before-and-after approach should be used so that any change in learning may be associated with that specific training progran. In this study, some other suggestions were included: As far as possible, the learning should be measured on an objective basis. Where possible, a control group (not receiving the training) should be used to compare with the experimental group which receives the training. Where possible, a statistical analysis should be used for evaluating the training results. Statistical analysis can provide an evident proof in terms of correlation or level of confidence.

The evaluation in terms of learning requires more knowledge and skills than evaluation in terms of reaction. For planning the evaluation procedures, analyzing the data, or interpreting the results, a relatively high level of statistical knowledge is necessary. In certain cases training departments may have to seek the help of professional statisticians.

It was pointed out in this article that it would be relatively easy to plan classroom demonstrations and presentations to measure learing where the program was aimed at the teaching of skills. It was suggested to use a paper and pencil test where principles and facts were the objectives of the traing program. If a standardized test is available and the place is suitable, it is advisable to use it. If, on the other hand, it is not
possible to find a suitable standardized test, the trainer may use his own skills and ingenuity in devising his own measuring instrument. $\lambda$
Kirkpatrick. (1959a) has cited the example of the American Telephone and Telegraph Company which incorporated into their "Personnel Factor in Management" program, a short test measuring the sensitivity and empathy. This paper and pencil test measures learning in this company's own program. In this test, each individual is asked to rank, in order of importance, sometimes dealing with human relations. A group discussion follows this activity. After additional group activities, a determination is made of the degree increase of sensitivity at the end of the program. The ability to measure reaction and learning in a particular program can be used to advantage in "selling" future programs and in increasing one's status and position in the organization, especially if a training director can prove that his program has been effective in terms of reaction and learning.

Evaluating Programs in Terms of Behavior: The next step of measuring the effectiveness of training programs is the behavior step. The emphasis of this section is on describing briefly some of the best experiments which have been used to measure training program effectiveness in terms of on-thejob behavior. As was predicted previously, only methods and instruments used in these studies are described here since the data, per se, is irrelevant to this particular study.

Kirkpatrick (1979) indicates that there may be a big difference between knowing principles and techniques and using them on the job. Kirckpatick's idea was supported by Robert Katz, a professor at Dartmouth. Katz (1956) recognized the problem which existed in a transition between learning and changes in behavior on the job. Katz (1956, p. 72) stated:

If a person is going to change his job behavior, five basic requirements must exist:

1. He must want to improve, 2. He must recognize his own weekness. 3. He must work in a permissive climate. 4. He must have some help from someone who is interested and skilled. 5. He must have an opportunity to try out the new learned ideas, (p. 72).

If these five conditions are met, there can be some measures for predicting the success of training programs. Kirkpatrick (1960a) suggests five guideposts to follow in evaluating training programs relative to behavior changes. These guideposts are:

1. A systematic appraisal should be made of on-the-job performance on a before-and-after basis.
2. The appraisal of performance should be made by one or more of the following groups (the more the better):
A. The person receiving the training
B. His superior or supervisors
C. His subordinates
D. His peers or other people thoroughly familiar with his performance.
3. A statistical analysis should be made to compare before and after performance and relate changes to the training program.
4. The post-training appraisal should be made three months or more after the training so that the trainees have an opportunity to put into practice what they have learned. Subsequent appraisals may add to the validity of the study.
5. A control group (not receiving the training) should be used (p. N.A.).

Other studies included in this review have dealt with behavioral changes as an evaluative step for the training programs. These are described below.

Meier and Pulichere (1980) described an effort to measure behavioral change as a resült of an assertiveness training program conducted at a research and development facility in New Jersey. This training program was conducted by an experienced external trainer from the Women's Center for group of 10 to 12 participants. Over the two and one-half years in which these programs were conducted, two trainers and 14 facilitators took part in training 206 participants in 16 sessions.

The training content of the above mentioned program was standard assertiveness training fare. The program was company sponsored and was on a voluntary basis. The target population consisted of four groups whose selection was rationalized and supported by the training objectives, which was to reduce passive behavior in three populations within the engineering center of the company's facility. Minorities and women were two elements of the population. When an audit of their performance appraisal was made, it was revealed that women and minorities had a disproportionate number of comments indicating inappropriately passive behavier. The short service employers, a third population, faced problems of passive behavior which was identified by supervisors and senior-technical employees.

An instrument was developed to be used on a before and after basis for measuring the change of behavior caused by this training program. This instrument was to be completed at the beginning of each session by the participant's immediate supervisor and then again six weeks after the conclusion of the session, thus yielding data collected over a 12-week span.

The instrument provided the opportunity to make a comprehensive comparison in behavior before and after the training program. The supervisor was asked to rate statements about the employee's behavior in typical work situation on an evaluative instrument with a five point scale. The instrument contained seven questions for each area of behavior: assertive, passive, and aggressive. The summation of supervisors' responses to each behavior may be compared in both before and after situations and an evaluation of change in behavior can be made on this basis.

Only 19 pairs of responses, out of 36 , were considered usable from the three assertiveness training groups on which the instrument for measuring perceived behavior was used. The difference of 17 resulted chiefly from a change of supervisors during that period. For using the statistical test, it was realized that the number of participants measured was relatively small. It was decided therefore to use the "t-test" whose results indicated that assertiveness training did have a direct effect on the participants' behavior.

As the main objective of the program was to reduce passiveness and to replace it with assertiveness, the organization was highly pleased with these results. Not much concern was shown about the less significant decrease in aggressiveness, particularly in light of the low level of aggressiveness as measured by the initial instruments.

There was an endeavor to measure the reactions of the participants. To fulfill this objective, participants were asked to characterize the program's usefulness to themselves on the following five point scale: (poor, fair, good, very good, and excellent).

It was concluded that the assertiveness training program proved to be successful along several dimensions. The supervisor observed a significant supportive change in the participants' behavior and the participants' attitude and the participants' reaction was very positive towards the program, indicating its usefulness. It was recommended that the program, should be continued in its present form and be initiated at other company locations.

Flishman-Harris Studies: Kirkpatrick (1960a), while reviewing literature relative to measring effectiveness of training programs in terms of on-the-job behavior, found that Flishman used seven paper-and-pencil
questionnaires and surveyed a group of trainees, their supervisors and their subordinates. According to Kirkpatrick, to evaluate a training program which had been conducted at the Central School of the International Harvester Company, Fleishman developed a study design and a battery of research instruments. These were used to evaluate the effectiveness of that particular training program.

Kirkpatrick further related that a follow-up study was conducted by Harris, in the same organization, to support the date which Fleishman had discovered. He worked with experimental and control groups by using be-fore-and-after measures of job performance. The sources for obtaining information were trainees themselves as well as their subordinates.

The Sorensen Study: Kirkpatrick (1960) describes this study as the most comprehensive research ever conducted to evaluate the effectiveness of training program in terms of on-the-job behavior. The study was conducted at the Crotonville Advanced Management Course of The General Electric Company. The title used for that study was "observed changes inquiry." The punpose of the "inquiry" was to answer the questions:

1. Have manager graduates of General Electric's Advanced Management courses of 1956 been observed to have changed in their manner of managing?
2. What inferences may be made from similarities and differences of changes observed in graduates and nongraduates? (p. N.A.).

The different approaches were used to measure observed behavior by asking the managers (graduates and non-graduates alike) to indicate changes they observed in their own style of managing during the previous twelve months. The second group contacted were the subordinates who were asked to describe changes they had observed in the managers during the past twelve months. Another group which was included in the inquiry con-
sisted of their peers. The peers were asked to describe changes in behavior. The last group to be included consisted of the superiors of the control and experimental groups. These individuals were asked to describe the changes which they rated in their subbordinates' behavior. These data were very helpful for comparing the observed changes of all four groups.

Instead of using the before and after approach, Sorensen used experimental as well as control groups and asked eleven of the participants to indicate what changes, if any, had taken place during the past year. Four different appoaches to measure observed changes included the man himself, his subordinates, his peers, and his superiors. The comprehensiveness of his study is positively effected by aggragating the findings of this multi-group approach.

The Moon-Hariton Study: Moon and Hariton (1958) conducted a study in the engineering section of the department of the General Electric Company, upon realizing the need for a more extensive appraisal and personnel development program. Its two main features were: (1) a revised performance appraisal system and (2) a training program designed to equip line managerial personnel to use appraisal information in helping their subordinates develop themselves. To attempt to evaluate the effectiveness of the program, a questionnaire was designed to obtain the subordinates' view about changes in their managers. It was felt that the opinions of the manager would add to the picture; therefore, they were also surveyed. The questionnaire asked respondents to compare present conditions with what they were two years ago. In other words, instead of measuring the attitudes before and after the program, the subordinates and the managers were asked to indicate what changes had taken place during the last two years.

The Stroud Study: Stoud (19.59) used several different approaches to evaluate a new Training Program called "Personal Factors in Management" at the Bell Telephone Company of Pennsylvania. These approaches were used to compare the results and obtain a more valid indication of on-thejob behavioral changes that resulted from the program.

For determining whether or not the Training Program fulfilled the objectives, the first step was the formulation of a questionnaire to be filled out by four separate groups: (1) conferees (2) controllees supervisors (not taking the courses) (3) supervisors of the conferees and (4) supervisors of the controllers.

The first part of the questionnaire was the "consisideration scale" taken from the leader behavior description questionnaire which originated in the Ohio State University leadership studies. The second part of the questionnaire was called the critical incident section in which the conferee and control groups were asked to describe four types of incidents that had occurred on the job. The third and final section of the questionnaire applied to the conferees only. Their opinion about helpfulness of the training course in achieving each of its five stated objectives.

The decision about the evaluation of this program was made after it had begun. Therefore, it was impossible to make before and after comparison, though the superiority of measuring behavior prior to the program and then comparing it to behavior measured after the program was recognized and mentioned by Miss Stoud, however, in this study, an attempt was made to get the questionnaire respondents to compare on-the-job behavior before the program with that following the program.

The above-mentioned studies attemted to evaluate the programs in terms of on-the-job behavior. The usefulness of measuring the effective-
ness of training programs in scientific and statistical terms is very necessary and worthwhile if training programs are going to increase in effectiveness and their benefits made clear to top management.

The next step of evaluating program effectiveness can be stated in terms of results. The objectives of most training programs are desired in terms of results. These results, according to Kirkpatrick (1960b), could be classified as: reduction of costs; reduction of turnover and absenteeism; reduction of grievances; increase in quantity and quality of production; or improved morale.

Kirkpatric suggests that it would be best to evaluate training programs directly in terms of results desired. It was also recommended that, for evaluating programs in terms of results, the training directors should start evaluating in terms of the results desired. It was also recommended that, for evaluating programs in terms of results, the training directors should start evaluating in terms of the three criteria mentioned earlier: determining the reactions of the trainees, attempting to measure what learning takes place, and trying to measure changes in on-the-job behaviors.

Several evaluations have been made in terms of results. They do not offer specific formulas for other training directors. Every trainer, in his specific situation, can use his own skills and ingenuity in devising his own measuring instrument. Some of such studies are cited below.

Safety Programs: A study was briefly described by Kirkpatrick (1960b) in which a comparison was made of plant safety records for the nine month period before the training program with a comparable period after the program.

About one of their safety programs, Dr. G. Roy Fugul of the General Electric Company, described a before-and-after evaluation, at a 1958

Conference of The Management Institute, University of Wisconson. The purpose of the training was to reduce the number of accidents and to increase the regularity with which all accidents, major and minor, were reported. The Training Program consisted of the usual presentations, discussions, and movies which were very dramatic in describing accidents and their implications. When a comprehensive evaluation was made of the training program it was found that the training program had not achieved the desired results.

While describing an evaluation of change model, Miner and Miner (1977) suggest that the personal manager should be capable of carrying out change evaluation studies on his own programs when appropriate. To discriminate between a good study and a poor one, the manager should have a sufficient knowledge of the logic of evaluation.

For providing knowledge about the logic of evaluation, Miner and Miner (1977, P. 329) discussed two models. The "before and after" model was compared with an "after-only model". To determine that the change, if any, was caused by the course itself, and not by some external factor, it was suggested that a control group be used carrying out the same pretest-posttest procedure. This will help to determine the effectiveness of treatment by comparing with an experimental group.

## Summary

Related literature was reviewed in this chapter exploring the background and factors which led to federal legislation regarding educational equity programs and included methodologies and results of previous research studies. Some other techniques used for evaluating training programs were also reviewed.

In the review of literature it was found that the number of working women had increased during the last two decades but that their average earning were lower than those of men. It was found that women, as compared to men, were equally educated. It was found, however, that though women comprised slightly more than half of the vocational education students, most were prepared for traditionally female oriented, low paying occupations.

While evaluating the effectiveness of training programs, different methods were found to be useful and helpful for determining the methodology for this study. The most common methods being used by evaluators include, before and after methods with control and experimental groups, and an "only-after" model with and without control groups.

The four common steps of evaluation were mentioned and several studies were cited using four steps as criteria for evaluation. These steps included reaction, learning, behavior, and results.

## METHODOLOGY

This chapter explains the methodology utilized in this research study to collect data and analyze results. As indicated previously, the purpose of this study was to determine whether or not a statistically significant change in the sex distribution of enrollments in programs of vocational education in Oklahoma has occured since the educational equity operation was initiated.

## Selection of Subjects

A panel of experts was organized from the State Department of Vocational and Technical Education to help select and classify schools for the study. Oualifications and designations of the panel of experts appear in Appendix C. The panel met on the 7th of March 1979 to determine the status of non-traditional programs and also to determine the status of the schools relative to their being urban, suburban or rural.

The members of the committee reviewed lists of all the programs offered in Oklahoma Vocational Technical Schools, Comprehensive High Schools and in Area Vocational Technical Schools including full-time adult programs and special vocational programs for high school students and adults.

Based upon the panel's recommendation, the programs' list was divided into two categories, i. e., male oriented and female oriented. The list
of such programs appear in Appendix E. Programs in which experts observed that traditional enrollments were dominated by the male students, were labled as male oriented programs. In some future references, the abbreviation " M " was used for male and " F " was used for females.

The programs thus divided in two categories were further divided into sub-categories, for reporting to the United States Office of Education (USOE). The following further breakdown in the enrollments was decided for the above-mentioned reporting purpose:

1. Enrollments in Area Vocational Technical Schools (AVTS).
2. Enrollments in Comprehensive High Schools (HS).
3. Enrollments in the programs offered in big cities (urban).
4. Enrollments in the programs offered in medium sized towns (sub-urban).
5. Enrollments in the programs offered in small sized towns (rural).
6. Enrollments in the programs offered at the secondary school level, i.e., a program designed for high school youths including grade 9 - 12.
7. Enrollments in the programs offered for adult persons who have completed or left high school and who are not described in the definitions of post-secondary or secondary programs.

Collection of the Data

Upon determining the type of breakdown to be made, the Division of System Design and Computer Services at Oklahoma State University, was contacted for retrievel of the above-mentioned data for the years 1972-1979.

The Division of System Design and Computer Services provides contracted services of various kinds, including data storage and subsequent retrieval, system analysis, programming and data control activities associated with computer system input/out put.

The Oklahoma State Department of Vocational and Technical Education (OK Vo-tech), has developed a form (included in Appendix A) called program enrollment form, under the Vocational Education Data System (VEDS). Such reporting has been required by, Federal Law (1976), for certain states. These systems are designed to meet planning and overall needs for data.

The following data were gathered annually through Vocational Education Data system:
A. Individual Student Enrollment Record

1. Sex
2. Handicapping Conditions
3. Disadvantaged Conditions
4. Race
5. Age
B. Completion Status
6. Continuing in the program this year
7. Was not in the program last year
8. Transferred to another vocational program at the same school or in-district AVTS.
9. Transferred to another school.
10. Transferred out of vocational education into an academic or general education program at the same school.
11. Left School prior to completion of program but completed $50 \%$ or more of the program.
12. Left school prior to completion of the program, completed less
than $50 \%$ of the program.
13. Completed the program.
C. Follw-up
14. In College
15. Working full-time in field or a closely related field.
16. Employed part time
17. Unemployed
18. National labor force
D. Certain Routine Reports
19. Summary of enrollment by school District/Division
20. Follow-up study of graduates
21. Occupational Training Information System (supply)
E. Other reports as requested by users.
Development of the Instrument
As mentioned earlier, a breakdown in the enrollment was made to determine whether or not a change in the sex distribution of enrollments in programs of vocational education in Oklahoma has occured since the educational equity operation was initiated by Oklahoma State Department of Vocational and Technical Education.
The breakdown of enrollment was made in many major areas including enrollments in: AVTS, high schools, programs offered in urban, suburn and rural areas, programs offered at secondary and adult levels.

Analysis of the Data

As hypotheses One, Three, Four, and Five fall under the category of nominal data, the Chi-Square statistic was selected to test these hypotheses. Hypothesis Two attempts to compare mean percentages of two groups
i.e., percentage of minority enrollments before and after 1976. If one is to determine if the mean performance of two groups is significantly different or while attempting to determine if the difference between two means is greater than that which could be expected from chance, Key (1974) suggests to use the " $t$ " test as an appropriate statistical technique in this situation. Thus the dependent " $t$ " test was used to compare the mean percentages of both the groups, i.e., minority percentage before and after 1976.

## CHAPTER IV

RESULTS

## Introduction

The purpose of the study was to determine whether a change in the sex distribution of enrollments in programs of vocational education in Oklahoma has occured since the educational equity operation was initiated. A total of 51 program areas which are traditionally cosidered male programs or female programs were identified for use in this study. There were 19 traditionally female programs and 32 traditionally male programs identified by the experts listed in Appendix C.

The design of this study included the development of five hypotheses. Each of these hypotheses contained one or more specific areas of comparison. The focus of comparison was always on minority enrollments "before" and "after" 1976, the year in which the educational equity emphasis was initiated in Oklahoma by the State Department of Vocational and Technical Education.

Hypothesis One was tested using the chi square statistic, by comparing sex distribution in all traditional programs before and after 1976. Hypothesis Two related to an assessment of the minority enrollments before and after 1976 in each of the selected programs. The " $t$ " test was made to determine if the difference between the two groups was greater than that which could be expected from chance. To conduct these tests, the minority per-
centage was aggregated both before and after 1976 for each pnogram and the mean percentages.were compared.

Identifying points of difference helps in address the solution in a specific area. Moreover, a Federal regulation requires that detailed results must be revealed when Federal funds have been expended. Consequently, a specific check of minority enrollment was made to compare before and after enrollments using the educational equity emphasis beginning in 1976 as the mid-point. The specific breakout and comparison of data was made to test hypotheses numbers three, four and five in the following categories: Area vocational-technical schools versus comprehensive high schools, programs located in urban, sub-urban, or rural areas; and secondary vocational programs versus full-time adult vocational programs. In some cases, the comparisons was made separately for traditionally male-oriented and traditionally female-oriented programs.

Analysis of Sex Differences in

Vocational Programs

Hypothesis One: There is no statistically significant difference in sex distribution within vocational programs when enrollments before and after 1976 are compared. Table $I$ shows the analysis of sex difference in vocational programs and breaks enrollments, for the purpose of comparison, into two main categories: before 1976 and after 1976.
$\mathrm{Ho}_{1}:$ The chi-square test reveals that this hypothesis can be rejected at the $p<.001$ level of significance. It is concluded, therefore that there was a significantly greater ratio of minority to majority sex enrollments after 1976.

TABLE I
CHI-SQUARE ANALYSIS OF SEX DIFFERENCE IN VOCATIONAL PROGRAM ENROLLMENT

| Period | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :---: | :---: | :---: | :---: |
| Before 1976 | 26,881 | 261,320 | 2700.588 |
| After 1976 | 34,958 | 217,735 |  |
| $\mathrm{P}<.0001$ |  |  |  |

Analysis of Sex Differences in<br>Specific Program Enrollments

For analyzing sex differences in specific programs, minority enrollments before and after 1976 were aggregated and their percentage of total enrollment was calculated. A hypothesis was formulated involving the difference in these two groups, i.e., before and after 1976.

Hypothesis Two: There is no statistically significant difference in sex distribution in the specific program areas listed in Table II when enrollments before and after 1976 are compared. Data in Table II indicate the percentage of minority enrollments in the specific programs and the results of the " t " test.
$\mathrm{HO}_{2}$ : The " $t$ " test reveals that this hypothesis can be rejected as the calculated value of the probability is .0287 . Because it is less than .05 , this hypothesis is rejected and it may be concluded that there is a significant difference in sex distribution for specific program areas

11sted in Table $I I$, with the ratio of minority to majority enrollments measuring after 1976.

TABLE II

## PERCENTAGE OF MINORITY ENROLLMENT IN SPECIFIC PROGRAMS AND " $t$ " TEST ANALYSIS OF DIFFERENCES

| Program | Percenta <br> Before 1 | Enrollme <br> After 19 |
| :---: | :---: | :---: |
| Agriculture | 4.22 | 9.08 |
| Horticulture | 50.00 | 48.82 |
| Project Distributive Education | 42.76 | 35.60 |
| Air-conditioning and Refrigeration | 0.14 | 0.37 |
| Appliance Repair | 0.02 | 2.85 |
| Auto Body | 0.29 | 0.68 |
| Auto Mechanics \& Compact car mechanics | 0.37 | 2.02 |
| Commercial Art | 46.81 | 45.78 |
| Commercial Photo | 49.11 | 34.48 |
| Carpentary | 0.29 | 1.17 |
| Electricity | 0.29 | 1.06 |
| Diesel Mechanics | 0.04 | 0.59 |
| Brick Masonary | 0.31 | 0.88 |
| Drafting | 16.95 | 16.25 |
| Electronics | 1.66 | 5.61 |
| Printing | 33.84 | 53.22 |
| Machine Shop | 0.36 | 3.56 |
| Sheet Metal | 0.18 | 1.29 |
| Welding | 0.31 | 1.61 |
| Small Engine Repair | 0.74 | 1.82 |
| Cabinet Making | 0.73 | 5.46 |
| Coordinated Vocational Education T |  |  |
| Mechanical Cluster | 0.45 | 0.97 |
| Construction | 0.30 | 2.06 |
| Horticulture | 21.36 | 23.70 |
| Heavy Equipment Operator | 2.77 | 4.36 |
| Truck Driver | 6.85 | 24.81 |
| Meat Processing | 3.33 | 9.80 |
| Custodial Service and Maintenance/ Building \& Ground | 1.87 | 6.87 |
| Interdisciplinary Cooperative Education | 45.55 | 43.78 |

TABLE II (CONTINUED)

| Program | Percentage of <br> Before 1976 | Minority <br> Enrollment <br> After |
| :--- | ---: | ---: |
| Distributive Education | 38.10 |  |
| Dental Office Assistant | 0.40 | 0.61 |
| Health Services | 6.48 | 5.79 |
| Operating Room Assistant | 22.97 | 17.20 |
| Comprehensive Home Economics | 8.44 | 16.21 |
| Cloth Production and Management | 1.01 | 1.67 |
| Food Management | 28.86 | 48.75 |
| Institutional and Home Services | 0.36 | 2.78 |
| Cooperative \& Home Economics |  |  |
| $\quad$ related Occupations | 21.19 | 28.79 |
| Child Care | 1.07 | 2.44 |
| Data Processing | 2.17 | 19.59 |
| Secretarial Training | 2.67 | 1.38 |
| Graphics | 34.60 | 1.39 |
| Cosmetology | 0.66 | 37.65 |
| Tailoring | 47.48 | 33.68 |
| Upholstery | 36.87 | 10.38 |
| Coordinated Vocational Education | 5.59 | 6.40 |
| $\quad$ Training Home \& Com. | 0.0 |  |
| Bank/Savings \& Loan |  | 14.04 |
|  |  |  |

$$
t=2.6084 \quad \text { Probability }=.0287
$$

Analysis of Sex Differences in AVTS and
Comprehensive High Schools

As indicated previously, partly because of Federal requirements and partly to facilitate addressing the problems in specific areas, the decision was made to analyze the enrollment data in area vocational technical school programs. The following hypothesis was formulated to address this area of concern.

Hypothesis Three A: There is no statistically significant difference in sex distribution in AVTS programs when enrollments before and after 1976 are compared. The enrollment data in AVTS programs were aggregated and further divided into two groups, i.e., before and after 1976. Table III depicts the data relating to this point of concern.

The analysis of data in Table III indicates that the probability, with 1 degree of freedom, was less than .0001; therefore, this hypothesis may be rejected. It may be concluded that there is a statistically significant difference in sex distribution in area vocational-technical school programs when enrollments before and after 1976 are compared with a greater proportion of minority students enrolled after 1976.

TABLE III

```
CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN AVTS PROGRAM ENROLLMENT
```

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | 3,274 | 40,793 | 445.682 |
| After 1976 | 6,216 | 48,201 |  |
| $P<.0001$ |  |  |  |

Hypothesis Three B: There is no statistically significant difference in sex distribution in comprehensive high school vocational programs when enrollments before and after 1976 are compared. Table IV shows the
probability to be less than .0001 . On this basis, the null hypothesis is rejected. There is a significant difference with a greater ratio of minority sex in comprehensive high school vocational programs after 1976.

TABLE IV

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN COMPREHENSIVE HIGH SCHOOL VOCATIONAL PROGRAMS

Hypothesis Four A1: There is no statistically significant difference in sex distribution of enrollments in traditionally male-oriented programs located in urban areas when enrollments before and after 1976 are compared. Table V presents the results of analysis of the data pertinent to this concern.

TABLE V

$$
\begin{aligned}
& \text { CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN TRADITIONALLY } \\
& \text { MALE-ORIENTED VOCATIONAL PROGRAM ENROLLMENT } \\
& \text { IN URBAN AREAS }
\end{aligned}
$$

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | 1,463 | 7,676 |  |
| After 1976 | 1,713 | 5,932 | 111.0812 |
| $\mathrm{P}<.0001$ |  |  |  |

The chi-square analysis reveals that this hypothesis can be rejected on the basis that $p<.0001$. This implies that the statistically signifi-cant difference probably does exist in enrollments before and after 1976 in traditionally male-oriented vocational programs located in urban areas.

Analysis of Sex Distribution in Traditionally Male
Oriented Vocationa1 Programs Located in
Suburban Areas

For the purpose of comparison and analysis in the two groups, i. e., enrollments before and after 1976 in traditionally male oriented vocational programs located in suburban areas, the following hypothesis was formulated.

Hypothesis Four A2: There is no statistically significant difference in sex distribution of enrollments in traditionally male oriented programs located in suburban areas. For the purpose of this analysis, the chi-square statistic was employed. Data in Table VI indicate that the probability, in this case, was less than .0001 ; therefore, $\mathrm{HO}_{4 \mathrm{~A} 2}$ can be rejected.

TABLE VI

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN TRADITIONALLY MALE ORIENTED VOCATIONAL PROGRAMS LOCATED IN SUBURBAN AREAS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | 2,365 | 17,774 | 331.7447 |
| After 1976 | 1,911 | 7,832 |  |
| p<.0001 |  |  |  |

Analysis of Sex Distribution in Traditionally Male

Oriented Vocational Programs Located in
Rura1 Areas

Hypothesis Four A(3) relates to sex distribution in traditionally male oriented vocational programs located in rural areas.

Hypothesis Four A(3): There is no statistically significant difference in traditionally male oriented vocational programs located in rural areas when enrollments before and after 1976 are compared. Data pertinent to this group and the analysis results are presented in Table VII.

TABLE VII

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN TRADITIONALLY MALE ORIENTED VOCATIONAL PROGRAMS LOCATED IN RURAL AREAS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | $\bullet$ | 7,140 | 78,537 |
| After 1976 | 6,676 | 63,476 | 612.550 |
| p<.0001 |  |  |  |

The chi-square test reveals that this hypothesis can be rejected at the $\mathrm{p}<.0001$ level of significance. This result implies that a statistically significant difference probably does exist in traditionally male-oriented vocational programs when enrollments before
and after 1976 are compared.

Analysis of Sex Distribution in Traditionally Female
Oriented Vocational Programs Located in Urban Areas

Hypothesis Four B(1) relates to sex distribution in traditionally female oriented vocational programs located in urban areas.

Hypothesis Four $B(1)$ : There is no ststistically significant difference in sex distribution of enrollments in traditionally female oriented vocational programs located in urban areas. Appropriate data and the results of the analysis are presented in Table VIII.

TABLE VIII

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN TRADITIONALLY FEMALE ORIENTED VOCATIONAL PROGRAMS LOCATED

IN URBAN AREAS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :---: | :---: | :---: | :---: |
| Before 1976 | 2,568 | 12,262 | 10.47109 |
| After 1976 | 2,293 | 9,880 |  |
| $p<.001$ |  |  |  |

The chi-square test reveals that this hypothesis can be rejected at the $p<.001$ level of significance.

Analysis of Sex Distribution in Traditionally Female
Oriented Vocational Programs Located in
Suburban Areas

Hypothesis Four $B(2)$ was developed to analyze the sex distribution in traditionally female oriented vocational programs located in suburban areas.

Hypothesis Four $B(2)$ : There is no statistically significant difference in sex distribution of enrollments in traditionally female oriented vocational programs located in suburban areas. Results of the analysis are presented in Table IX.

TABLE IX
CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN TRADITIONALLY FEMALE ORIENTED VOCATIONAL PROGRAMS LOCATED

IN SUBURBAN AREAS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :---: | :---: | :---: | :---: |
| Before 1976 | 5,166 | 24,362 | 765.743 |
| After 1976 | 6,905 | 18,367 |  |

$\mathrm{p}<.0001$

The chi-square test reveals that this hypothesis can be rejected at the $p<.0001$ level of significance.

```
Analysis of Sex Distribution in Traditionally Female
Oriented Vocationa1 Programs Located in
Rura1 Areas
```

Hypothesis Four $B(3)$ was developed to analyze the sex distribution in traditionally female oriented vocational programs located in rural areas.

Hypothesis Four $B(3):$ There is no statistically significant difference in sex distribution of enrollments in traditionally female oriented vocational programs located in rural areas. Results of the analysis are presented in Table X.

TABLE X

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN TRADITIONALLY FEMALE ORIENTED VOCATIONAL PROGRAMS LOCATED

IN RURAL AREAS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | 6,915 | 79,915 | 947.03528 |
| After 1976 | 9,244 | 64,041 |  |
| p<.0001 |  |  |  |

The chf-square test reveals that this hypothesis can be rejected at the $p<.0001$ level of significance. Within all the groups identi-
fied by the six sub-hypotheses, the ratio of minority sex enrollment increased after 1976.

Analysis of Sex Differences in Secondary<br>School Vocational Program Enrollment

Hypothesis Five A was developed to analyze the sex distribution in secondary school vocational programs.

Hypothesis Five A: There is no statistically significant difference in sex distribution in secondary school vocational programs when enrollments before and after 1976 are compared. Table XI presents the results of the analysis.

The chi-square test reveals that this hypothesis can be rejected at the $\mathrm{p}<.0001$ level of significance. The ratio of minority sex enrollment was greater after 1976.

TABLE XI
CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN SECONDARY SCHOOL VOCATIONAL PROGRAMS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | 25,913 | 248,500 |  |
| After 1976 | 32,664 | 204,654 | 2343.6436 |
| $p<.0001$ |  |  |  |

## Analysis of Sex Differences in Full-Time

## Adult Vocational Programs

Hypothesis Five B was developed to analyze the sex distribution in full-time adult vocational programs.

Hypothesis Five B: There is no statistically significant difference in sex distribution in adult vocational programs when enrollments before and after 1976 are compared. Table XII presents the results of the analysis.

TABLE XII

## CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN FULL-TIME ADULT VOCATIONAL PROGRAMS

| Group | Minority <br> Enrollment | Majority <br> Enrollment | Chi <br> Square |
| :--- | :---: | :---: | :---: |
| Before 1976 | 967 | 12,803 | 242.955 |
| After 1976 | 1,568 | 10,727 |  |
| $p<.0001$ |  |  |  |

The chi-square test reveals that hypothesis H05B can be rejected at the $\mathrm{p}<.0001$ level of significance, therefore, it is concluded that there probably was a statistically greater ratio of minority to majority sex enrollments after 1976.

## Serendipitious Results

Some serendipitious results were obtained from observation of the data when cells were observed in Tables XIII through XVII. It appears that male were more likely to be a larger percentage of the enrollment in female-oriented programs than were female in male-oriented programs before 1976. The trend is reversed after 1976 where a greater percentage of female were enrolled in male-oriented programs in area vocational schools, in urban schools, and in adult programs. The fact that this trend did not appear in suburban and rural schools and in secondary schools in general may point up the barriers presented by tradition in provincial parts of the state which may be less supportive of female liberation. A second possible explanation for this variation may be that enrollments in non-traditional programs are increasing; however, for the most part, programs leading to low paying jobs (usually associated with traditional female jobs) simply are not attractive to the male population.

Figures 1 through 4 provide another way of visualizing the data from Tables XIII through XVII. The data for 1972-73 were omitted because they represented only two programs. This was not considered to be an adequate sample of the state-wide situation.

TABLE XIII

PERCENTAGE OF MINORITY ENROLLMENT BY ORIENTATION OF PROGRAM

| Year | Male Oriented | Female Oriented |
| :--- | :---: | :---: |
| $1972-1973$ | 7.01 | 9.69 |
| $1973-1974$ | 6.43 | 9.70 |
| $1974-1975$ | 8.13 | 10.78 |
| 1975-1976 | 10.19 | 12.94 |
| Total before 1976 | 7.94 | 10.78 |
| 1976-1977 | 11.43 | 14.68 |
| 1977-1978 | 13.53 | 15.60 |
| 1978-1979 | 11.51 | 15.92 |
| Total after 1976 | 12.16 | 15.40 |

TABLE XIV

PERCENTAGE OF MINORITY ENROLLMENT BY ORIENTATION IN AREA VOCATIONAL SCHOOLS AND HIGH SCHOOLS

| Year | High Schools |  | Area Vocational Schools |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | Male | Female |
|  | Oriented | Oriented | Oriented | Oriented |
| 1972-1973 | 7.29 | 9.73 | 5.55 | 9.22 |
| 1973-1974 | 6.73 | 9.89 | 5.09 | 8.36 |
| 1974-1975 | 8.56 | 11.11 | 6.47 | 8.33 |
| 1975-1976 | 10.29 | 13.68 | 9.46 | 7.82 |
| Total before |  |  |  |  |
| 1976 | 8.22 | 11.10 | 6.64 | 8.43 |
| 1976-1977 | 11.55 | 15.73 | 11.12 | 8.17 |
| 1977-1978 | 11.66 | 16.95 | 17.70 | 7.68 |
| 1978-1979 | 12.10 | 17.29 | 9.97 | 8.28 |
| Total after |  |  |  |  |
| 1976 | 11.77 | 16.66 | 12.93 | 8.04 |

TABLE XV
PERCENTAGE OF MINORITY ENROLLMENT BY ORIENTATION IN URBAN, SUBURBAN, AND RURAL SCHOOLS

| Year | $\begin{gathered} \text { Urban } \\ \text { Male } \\ \text { Oriented } \end{gathered}$ | Schools <br> Female <br> Oriented | Suburban Male Oriented | Schools <br> Female <br> Oriented | $\begin{gathered} \text { Rural } \\ \text { Male } \\ \text { Oriented } \end{gathered}$ | Schools <br> Female Oriented |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1972-1973 | 14.26 | 18.20 | 9.92 | 13.77 | 5.78 | 7.04 |
| 1973-1974 | 14.05 | 15.82 | 9.82 | 15.60 | 5.13 | 6.94 |
| 1974-1975 | 17.09 | 17.76 | 12.44 | 17.13 | 6.57 | 7.90 |
| 1975-1976 | 18.66 | 17.49 | 16.05 | 22.77 | 7.03 | 9.84 |
| Total before |  |  |  |  |  |  |
| 1976 | 16.02 | 17.32 | 12.06 | 17.32 | 6.13 | 7.93 |
| 1976-1977 | 25.84 | 18.91 | 18.71 | 25.80 | 8.80 | 11.86 |
| 1977-1978 | 19.96 | 18.22 | 19.66 | 27.77 | 9.72 | 12.98 |
| 1978-1979 | 20.82 | 19.40 | 20.57 | 28.33 | 10.04 | 13.01 |
| Total after 1976 | 22.21 | 18.84 | 19.65 | 27.30 | 9.52 | 12.62 |

TABLE XVI
PERCENTAGE OF MINORITY ENROLLMENT BY ORIENTATION IN SECONDARY AND ADULT PROGRAMS

| Year | Secondary Programs |  | Adult Programs |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | Male | Female |
|  | Oriented | Oriented | Oriented | Oriented |
| 1972-1973 | 7.16 | 9.57 | 4.77 | 36.42 |
| 1973-1974 | 6.56 | 9.80 | 4.59 | 7.04 |
| 1974-1975 | 8.32 | 10.91 | 5.64 | 8.42 |
| 1975-1976 | 9.02 | 13.34 | 14.72 | 4.67 |
| Total before |  |  |  |  |
| 1976 | 7.77 | 10.91 | 7.43 | 5.66 |
| 1976-1977 | 10.35 | 15.19 | 42.70 | 5.95 |
| 1977-1978 | 12.33 | 16.25 | 29.62 | 5.61 |
| 1978-1979 | 11.33 | 16.74 | 15.46 | 5.09 |
| Total after |  |  |  |  |
| 1976 | 11.34 | 16.06 | 29.26 | 5.55 |

T'ABLE XVII

INCREASE IN ENROLLMENTS

| Year | Minority | Difference | Percent | Majority | Difference | Percent |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1972-73 | 5,460 |  |  | 59,863 |  |  |
| 1973-74 | 5,854 | 394 | ( 7.22) | 66,433 | 6,570 | (10.98) |
| 1974-75 | 7,009 | 1,155 | (19.73) | 66,970 | 537 | ( 0.81) |
| 1975-76 | 8,558 | 1,549 | (22.10) | 68,054 | 1,084 | ( 1.62 ) |
| Average Percent Increase |  |  | (16.35) |  |  | ( 4.47) |
| 1975-76 | 8,558 |  |  | 68,054 |  |  |
| 1976-77 | 10,987 | 2,429 | (28.38) | 72,967 | 4,913 | ( 7.22) |
| 1977-78 | 12,555 | 1,568 | (14.27) | 73,586 | 619 | ( 0.85) |
| 1978-79 | 11,416 | -1,139 | (-9.07) | 71,182 | 2,404 | (-3.27) |
| Average | Percent Inc | rease | (11.19) |  |  | ( 1.60 ) |
| Increase from 1972-73 to 1978-79 |  |  |  |  |  |  |
| 1972-73 | 5,460 |  |  | 59,863 |  |  |
| 1978-79 | 11,416 | 5,956 | (109.08) | 71,182 | 11,319 | (18.91) |
| $\left.\begin{array}{l} 1973-74 \\ 1974-75 \\ 1975-76 \end{array}\right\} \quad 21,421 \quad 201,457$ |  |  |  |  |  |  |
| $\left.\begin{array}{l} 1976-77 \\ 1977-78 \\ 1978-79 \end{array}\right)$ | ) 34,958 | 13,537 | (63.14) | 217,735 | 16,278 | ( 8.08) |



Figure 1. Male/Female Total Enrollment Analysịs


Figure 2. Male/Female Enrollment Analysis by Types of School


Figure 3. Male/Female Enrollment Analysis by Location of School


Figure 4. Male/Female Enrollment Analysis by Level of Program

## CHAPTER V

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

During the women's movement of the 1960's and 1970's the different treatment of women and men has been condemned more than that in any other age. When general practice was found to be contrary to the national goal of equality, concerns over sex stereotyping have stimulated agencies and organizations nation-wide to reduce differences in treatment of women and men to justifiable situations. Apart from struggles made by individuals and state-level agencies, there have been many federal rules, regulations, acts, and subsequent amendments which have included steps to cope with the problem. The main focus of the federal intent of legislation was to recommend steps for providing equal opportunities to its citizens and to avoid discrimination in employment and education.

The Education Amendments of 1976 require that efforts towards the reduction of sex discrimination and sex stereotyping, both in training programs and in the occupations to which they lead, be monitored by state agencies. Moreover, a special request, from the Equity Staff for specific information was included in Annual Accountability report of 1978 of State Department of Vocational and Technical Education.

These requests were some of the factors which gave rise to this specific study. The main purpose of the study was to determine whether or not a statistically significant change in the sex distribution of enrollments in programs of vocational education in Oklahoma has occurred
since the educational equity operation was initiated.

With the help of a panel of experts, traditionally sex oriented programs were identified. Enrollments in these programs were aggregated, for the period 1972-1979.

The data was divided into the following sub-categories of enrollments in: Area vocational technical schools, comprehensive high schools, urban, sub-urban, rural, secondary schools and adult programs.

## Summary of Findings

The following findings were summarized as consequences of the outcomes of this research:

1. There was a significantly greater ratio of minority to majority sex enrollments after 1976.
2. There was a significant difference in sex distribution in favor of the after 1976 group in the specific program areas listed in table II.
3. There was a statistically significant difference in sex distribution in favor of the after 1976 group in area vocational-technical school programs.
4. There was a significant difference with greater ratio of minority sex in comprehensive vocational programs after 1976.
5. Within all the six sub-groups including programs located in urban, sub-urban, and rural in both male and female oriented programs, the ratio of minority sex enrollment increased after 1976.
6. The ratio of minority sex enrollment was greater after 1976 in both secondary school vocational programs and in Full-Time Adult programs.
7. Male were more likely to be a larger percentage of the enrollment in female oriented programs before 1976.

But the trend reversed after 1976 where a greater percentage of females were enrolled in male oriented programs in area vocational school in urban schools, and in adult programs. This trend did not appear in suburban and rural schools or in secondary schools in general.

## Conclusions

1. It is concluded that there has been a significant change in nontraditional enrollment since 1976 when the comparison was made with the enrollments in non-traditional programs before 1976. It is assumed that the Educational Equity operation did contribute to this change.
2. Enrollments in female adult programs shifted towards increased enrollments in non-traditional programs while adult male programs have not shown such a trend.

## Recommendations

1. It is recommended that emphasis on Education Equity be continued and that further studies with greater controls of trend data be conducted to test the assumption that the action taken by the Education Equity Program influences these changes.
2. If the State of Oklahoma desires to continue this movement with the adult population, special emphasis should be placed on male adult programs.
3. A similar study should be made of post-secondary programs, so that the effectiveness of such activities can be evaluated for that area.

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APPENDIX A

DATA COLLECTION INSTRUMENT

Please read instructions carefully before completing this form


APPENDIX B

RAW DATA


Male ofientec classes








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APPENDIX C

PANEL OF EXPERTS

## Panel of Experts

Dr. Fern Green, Chairperson, Director of Educational Equity Services, Division of Educational Equity Services.
Janice Burnett, Records Specialist, Division of Research Planning and Evaluation.
John Friedmann, Acting State Supervisor, DE/Marketting/present State Supervisor of Adult Education.
Paula Smith, Assistant Coordinator of Planning, Division of Research Planning and Evaluation.
Linda Wilson, Administrative Assistant of Educational Equity, Division of Educational Equity.

## APPENDIX D

## PROGRAM CLASSIFICATIONS


vTO.00014
-
PROGRAM CODE MASTER LISTING (NUMERICAL) PREPARED BY SYSTEMS DESIGN \& COMPUTER SERVICES

DATE RUN 10/31/78

|  | $\begin{aligned} & \text { PROGRAM } \\ & \text { CODE } \end{aligned}$ | PROGRAM NAME | - |
| :---: | :---: | :---: | :---: |
|  | C01000 | ADMINISTRATI ON | ADMINISTRATION |
|  | 002000 | OPER AND MAINT | OPERATION AND MAINTENANCE |
|  | 003000 | FIXED CHARGES | FIXED CHARGES |
|  | $0 C 4000$ | TRANSPORTATION | TRANSPORTATION |
|  | cosono | SUPPORT PGM-DISAD | SUPPORT PROGRAM FOR DISADVANTAGED |
|  | 008000 | SUPPORT PGM-HDCP | SUPPORT PROGRAM FOR HANDICAPPED |
|  | 009000 | WORK STUDY | WORK STUDY |
| Yn | . 010000 | VO AG | VOCATIONAL AGRICULTURE |
| m | 010029 | VO AG MECH | VOCATIONAL AGRICULTURE-MECHANICS |
| $M$ | 010057 | VO AG HORT | VOCATIONAL AGRICULTURE-HORTICULTURE |
| $\cdots \mathrm{M}$ | 010152 | AG BUSINESS | AGRICULTURE BUSINESS |
| M | 010154 | FARM BUS MGMT | FARM BUSINESS MANAGEMENT |
| $m$ | 010156 | VAOT | VOCATIONAL AGRICULTURE OCCUP TRAINING |
| $F$ | 040000 | DE | DISTRIBUTIVE ECUCATION |
| $F$ | 040166 | CASHIER CHECKER | CASHIER CHECKER |
| $F$ | C40900 | DE (COOPERATIVE) | DISTRIBUTIVE EDUCATION (COOPERATIVE) |
| $F$ | C70007 | DEN OFF ASST | DENTAL QFFICE ASSISTANT |
| $r$ | C70008 | HEALTH SER | health service careers |
| 5 | C70009 | DENTAL LAB ASST | DENTAL LABORATORY ASSISTANT |
| $F$ | C70074 | MED OFF ASST | MEDICAL DFFICE ASSISTANT |
| $F$ | C70086 | OPER RM TECH | - OPERATING ROOM TECHNICIAN |
| $F$ | c70159 | PRAC NURSE | PRACTICAL NURSE |
| $\cdots$ | CS0009 | HOME ECON | HOME ECONOMICS |
| - F | C90010 | CLOTH PROD \& MG:AT | CLOTHING PRODUCTICN \& MANAGEMENT |
| $F$ | 090.311 | FOOD MGMT | FOOD MANAGEMENT |
| $F$ | 090018 | OCC SERVIDOMESTIC) | OCCUPATIONAL SERVICES (DOMESTIC) |


| . |  | PROGRAM CDDE MASTER LISTING (NUMERICAL) PREPARED BY SYSTEMS DESIGN \& COMPUTER SERVICES |  |
| :---: | :---: | :---: | :---: |
|  |  | DATE RUN 10/31/78 |  |
|  | $\begin{gathered} \text { PROGRAM } \\ \text { CODE } \end{gathered}$ | PROGRAM NAME | ! |
| $F$ | C90020 | HOME FURNISHINGS | home furnishings |
| $F$ | 090044 | HERO | home economics related occupations |
| $F$ | C90096 | Child care | CHILD CARE |
| $F$ | 090130 | INSTI HOME SER | INSTITUTIONAL \& home Services |
| $\stackrel{F}{ }$ | CS0900 | HOME ECON (COOP) | HOME ECONJMICS (COOPERATIVE) |
| $F$ | 090911 | FOOD MGMT (COOP) | FOOD MANAGEMENT (COIJPERSi] . . |
| $\Gamma$ | 090944 | HERO (COOP) | home econ related occup (COOPERATIVE! |
| $F$ | 090996 | Child Care (COOP) | CHILD CARE (COOPERATIVE) |
| $r$ | 140000 | OFFICE ASST | OFFICE ASSISTANT |
| F | 14.0016 | Management | MANAGEMENT |
| $F$ | 140018 | SEC TRNG | SECRETARIAL TRAINING |
| $F$ | 140019 | SEC TRNG (COOP) | SECRETARIAL training (COOPERATIVE) |
| $F$ | 140022 | DATA PROC | DATA PROCESSING |
| $F$ | 140024 | GRAPHICS | GRAPHICS |
| $F$ | 140025 | OFFICE ASST (COOP) | OFFICE ASSISTANT (COOPERATIVE) |
|  | 140102 | BKPG \& ACCTG | BOOKKEEPING AND ACCOUNTING |
| F | 140106 | BANK/SAV \& LOAN | banking and savings and loan |
| $F$ | 140902 | BKPG \& ACCTGICDOP) | BCOKKEEPING AND ACCOUNTING (COOPERATIVE) |
| $F$ | 140906 | BANK/SEL (COOP) | BANKING \& SAVINGS \& LOAN (COOPERATIVE) |
| $F$ | 140916 | management (COOP) | MANAGEMENT (COOPERATIVE) |
| $F$ | 140922 | DATA PROC (COOP) | DATA PROCESSING (COOPERATIVE) |
| F | 140924 | GRAPHICS (COOP) | GRAPHICS (COOPERATIVE) |
| M | 170026 | AIRCOND \& REF | AIRCCNDITIONING AND REFRIGERATION |
| $M$ | 170027 | APPL REPAIR | APPLIANCE REPAIR |
| $M$ | 170028 | AUTO BODY | AUTO BODY |
| $M$ | 170029 | AUTO MECH | AUTO MECHANICS |



| VTO20014 |  | Program code master listing inumer |  |
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|  |  | DATE RUN 10/31/78 |  |
|  | $\begin{aligned} & \text { PROGRAM } \\ & \text { CODE } \end{aligned}$ | $\begin{aligned} & \text { PROG RAM } \\ & \text { NAME } \end{aligned}$ |  |
| 2 Pr | 170059 | AIRCRAFt frame | AIRCRAFT FRAME |
| 201 | 170060 | MEAT PROCESSING | MEAT PROCESSING |
| 502 | 170061 | custodial services | Custcoial services |
|  | 170062 | FLORICULTURE | FLORICULTURE |
|  | -1701-61- | RADIO-BROADCAST* | RADIO-BRTADC-A-S-FING- |
|  | 170162 | Heavy equip opr | HEAVY EQUIPMENT OPERATOR |
|  | 170163 | heavy equip mnt | HEAVY EQUIPMENT MAINTENANCE |
| 2d | 170164 | TRUCK DRIVER | TRUCK DRIVER |
| sol | 170166 | ELECT LINEMAN | ELECTRIC LINEMAN |
|  | 170517 | ELECTRO-MECH | ELECTRO-MECHANICAL |
|  | 170518 | IND CHEM | INDUSTRIAL CHEMISTRY |
|  | 170519 | OCC SERV (MAINT) | OCCUPATIONAL SERVICES (MAINTENANCE) |
|  | 17.0.525 | INARTS-C CRAFTS | INDIA N-ARTTS-AND_RAETS |
| col | 170540 | INSTRUMENT REPAIR | INSTRUMENT REPAIR |
|  | 200000 | GVET-UNASSTGNED | EVET-UNASSFGNED |
| Y11 | 200055 | CVET mech | CVET-MECHANICAL CLUSTER |
| \% | 200056 | CVET CONST | CVET-CONSTRUCTION CLUSTER |
| F | 200057 | CVET HCME \& COMm | CVET-home \& community service cluster |
| 3 | 200058 | CVET HORT | $\dot{\text { CVET-HORTICULTURE CLUSTER }}$ |
| $\Gamma$ | 200160 | CVET BUS | CVET-BUSINESS CLUSTER. |
| 111 | 200162 | CVET PRINTING | CVET-PRINTING CLUSTER |
| m | 210059 | VOC ORIENTATION | VOCATIONAL ORIENTATION |
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2<br>VITA<br>Mohammad Khalil-ur Rehman<br>Candidate for the Degree of<br>Doctor of Education

Thesis: AN ANALYSIS OF MALE-FEMALE ENROLLMENT TRENDS IN OKLAHOMA VOCATIONAL EDUCATION PROGRAMS DURING THE PERIOD 1972-1979

Major Field: Occupational and Adult Education
Minor Field: Business Elucation
Biographical:
Personal Data: Born in Pakistan, September 9, 1941, the son of Mohammad Saeed and Sakina Bibi.

Education: Graduated from Islamia High School Kunjah District Gujrat, Pakistan, 1958; received certificate of Carrier/Radio Technician grade IV and grade III, 1960; received certificate of Army Special Education, from Directorate of Army Education, Pakistan, 1973, received a certificate of Higher Secondary Education from Board of Education, Lahore Pakistan, 1964; received Bachelor of Arts from Panjab University, 1970; while studying for Master of Education in Business and Industrial Education, University of panjab and The Pennsylvania State University, specialized in teaching secretarial subjects, 1972, and 1977, respectively; completed requirements for the Doctor of Education degree from Oklahoma State University, December, 1980.

Professional Experience: Served in Pakistan Army as a carrier technician from 1958-1969; served as a part-time physical education instructor in Panjab University Laboratory School, New Camps, Lahore, Pakistan, Director of New Era College of Commerce and Technology (self-established) in Lahore and Kunjah, Pakistan, 1972-1974; Commercial Office Assistant in Hobba Trading and Contracting Company, Tripoli, Libya 1974-1975. Graduate Research Assistant, The Pennsylvania State University, 1976-1977; Graduate Research Associate from March 1979 to June 1980; Oklahoma State University; Member of Iota Lambda Sigma (ILS), Phi delta Kappa, Oklahoma Adult and Continuing Education Association, National Business Education Association and American Vocational Association.


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