AN ANALYSIS OF OKLAHOMA CITY HIGH SCHOOL TECHNICAL GRADUATES AS RELATED TO SUBSEQUENT HIGHER EDUCATIONAL PATTERNS

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CHAPTER I

THE PROBLEM

Introduction

Dating from the successful Russian space effort in the middle 1950's there has been a revolution in American education. At that time the public became aware of a gap in the traditional education programs and demanded a reappraisal of the then existing curriculums and techniques. The result was a shift in emphasis to highly technical and specialized fields.

This revolution cannot be understood as a change in degree but must be viewed as a change in kind, an entirely new factor. The application of science and technology to all fields in the economic spectrum has completely changed man's concept of work and as a result, his attitude toward education. Work is viewed as the paramount of human activities and education has become the way to achieve the end of a respectable occupation. A manifestation of this change is that a man is now judged by the work he does. The correlation between work, education and income as related to social position is seen in the fact that the United States Census Bureau measures socio-economic level by these three factors.

With the availability of education to the lower classes, then, has come change in the purpose of education from a means of achieving

an understanding of the "good life" to a means of achieving economic tools such as technical knowledges and skills. This change in attitude coupled with the events of the mid-fiftys brought education to a "face to face" confrontation with a new technical era based upon knowledge and skills of the masses.

One of the outgrowths of this confrontation was emphasis on two-year post high school technical programs, a new concept for many educators. This type of program was to serve a twofold purpose: (1) to give an educational alternative to individuals who previously had not pursued education beyond the high school level or had dropped out of traditional post high school programs for various reasons and (2) to provide a supply of technically qualified workers to a demanding economy.

Identification of students who would benefit from these two-year programs is one of the major areas in educational research today. The present inquiry focuses on socio-economic, academic and social participation factors as related to post high school program choice. In brief, this investigation attempts to answer the question, "What is the relationship between selected background factors of pretechnical[1] students and their subsequent educational patterns?"

Two related categories of hypothesis are to be tested in this paper. The first category is composed of hypotheses dealing with the dependence of post high school program choice on certain student background factors, while the second category deals with the dependence of success in technical programs upon student background factors.

Need For and Purpose Of the Study

If the technical revolution is to continue at its present rate of growth, education must meet the manpower challenge. Approximately 67,000 to 200,000 technicians will be needed each year between now and 1972;[2] in addition, 72,000 new engineers will be needed each of those years.[3] At present, there are 16,000 technicians and 34,000 engineers graduating each year in the United States.[4] Manpower is one of the country's greatest resources and must be developed in much the same way as any other important resource, something that has not been done in the past.

On this topic, A. J. Miller says:[5]

> There appears to be two essential elements to the solution of the 'engineering manpower shortage' problem. First, a great number of qualified youth must be attracted into the fields of engineering science and technology. Secondly, steps must be taken to reduce the large percentage of dropouts in present and future classes of trainees.

If two key words were to be selected from this quote, they would probably be "qualified youth". At first glance, this phrase seems to conflict with the first objective of the two-year programs, namely the training of youth who have not previously chosen to take advanced studies or who have dropped out of traditional programs. In fact, a large segment of high school graduates do not meet the minimum requirements for the rigorous new curriculums; this is underlined by a 30 percent dropout rate in post high school two-year technical programs.[6]

This fact indicates the necessity of pretechnical preparation at the secondary level of education. Secondary pretechnical programs have been established but as yet they have not provided an answer to the

fundamental need of supplying a prepared body of students for the advanced training.

One of the chief obstacles to achieving the secondary pretechnical programs' objectives is the confusion surrounding the identification of the potentially successful student. Counselors and advisors have very little scientific research on which to base decisions about the type of student who would benefit most from this training. At present, the Oklahoma City School System has no official guide for counseling students interested in technical programs and/or subjects. This fact seems to lead to unorganized selection of students, some of whom have neither the ability to complete the prescribed course of study nor an understanding of the program goals.[7] Many times, a lack of success in general education is the only criteria used for selection of students and as a corollary, even a limited success in general education is interpreted as indicating that the student should "save" himself for better things than "occupational" training.[8] This type of counseling must be the product of a complete misunderstanding of the nature of technical training, the technicians' skills and knowledges, the technicians' economic and social standing, and interest of the student.

If the pretechnical programs are to better accomplish their goals, some guide must be developed to enable counselors to recognize the technical student. Grant Venn is very specific about the need for improvement in technical counseling when he states:[9]

> The problem of expert guidance and counseling for young people entering occupational training is one of the most difficult in the field of education. All of us are deeply concerned that better methods be developed to help steer those people in the right direction. It seems certain that many potentially fine technicians,

for example, never enter the field because they do not know it exists.

In summary, it seems that there will be an ever-increasing demand for technically qualified people and that the ultimate responsibility for satisfying this need lies with the educational system. It further appears that the system cannot produce the required number of technicians without developing some meaningful counseling tools. This paper will attempt, by means of a case study of a certain group of pretechnical graduates, to outline some broad areas in which future research might find material on which to base a counseling guide.

Limitations

A good counseling guide would necessarily require the development of a highly sophisticated instrument to measure both intellective and non-intellective factors. This instrument would be based upon past research. The present study will be limited to several broad areas of student background suggested by prominent technical educators and is not designed to develop the instrument itself, but designed to give future researchers an indication of some factors that might be important indicators.

FOOTNOTES

[1]This paper will use the term pretechnical to mean high school technical programs which prepare the student for post high school technical education. It should not be confused with post high school programs offering students an opportunity to meet requirements for entering technical programs as defined in "Pretechnical Post High School Programs", Office of Education OE-80049, (Washington, D. C.), 1967.

[2]_____, "Education for a Changing World of Work." Summary Report of the Panel of Consultants on Vocational Education, Office of Education OE-80020, (Washington, D. C.), 1962.

[3]_____, "Engineering Manpower - A Statement of Position." Engineering Manpower Commission of Engineers Joint Counsel (New York, 1963), p. 23.

[4]Ibid, 16.

[5]A. J. Miller, "A Study of Engineering and Technical Institute Freshmen Enrollees and Dropouts in Terms of Selected Intellective and Non-intellective Factors." (Oklahoma State University, 1966).

[6]Ibid.

[7]Paul Simmons, Technical Counselor, Oklahoma City Area Vocational Technical Center, Faculty Meeting, Fall, 1967.

[8]Ibid.

[9]Grant Venn, "Training the Man of the Future: New Directions in Technical Education", The Journal of Technology (1967).

CHAPTER II

DEVELOPMENT OF HYPOTHESES

Logical Framework

At present, the Oklahoma City School System has three basic programs at the secondary level: (1) vocational, (2) pretechnical, and (3) college preparation. The vocational program is usually terminal at the completion of high school and prepares the student for job entry level employment in such skill fields as welding, auto mechanics, business, cosmotology, etc. The pretechnical program is designed to prepare the student for advanced study in two-year technical programs or related four-year programs such as engineering, architecture, etc. The post high school program usually awards an associate degree which combined with two additional years of study will qualify the student for the baccalaureate degree. The third program, college preparation, prepares the student with a liberal arts background. Although all three programs contain the general education requirements which qualify the student to enter the post high school program of his choice, many educators feel the liberal arts program provides a well-rounded curriculum to give the student flexibility of choice in that he will have knowledge in a variety of subjects.

Present policy indicates that these three programs define three types of students in very restricted terms. The first type, defined

by the vocational program, will not continue his formal education beyond the high school level and is seeking a secondary education which will prepare him for a specific field of work. The second type of student is defined by the pretechnical program and will fall into one of two categories: (1) those students who wish to continue their education in a particular technical field but for social, economical, personality, or ability reasons prefer the two-year program, and (2) those students who have selected a technical area for a career and include pretechnical subjects in their secondary education as a means of being better prepared to continue their education at the college level. The third type of student is defined by the liberal arts program and will also fall into two rough categories: (1) those students who wish to continue their education at the post high school level but have not yet decided upon a particular field, and (2) those students who wish to continue their education at the post high school level in an area where specialized training offered in vocational or technical programs will not be beneficial.

A close examination of the differences between post high school technical programs and baccalaureate programs might reveal clues as to the background and ability characteristics of students who select one program in preference to the other. It seems logical to assume that because of the wide differences in the programs, there will be noticeable differences in the characteristics of the students, and that these differences will be related. Students who chose pretechnical programs as preparation for the four-year degree should share characteristics with both the liberal arts majors and the technical

majors, however, the four-year technical program is much more closely associated with the liberal arts because of the inclusion of general education in the curriculum. For the purpose of this study, those students who choose to continue their education at the baccalaureate level in technical areas will be considered as belonging to the four-year group.

The three most obvious characteristics (from the students' point of view) of the two-year program as compared to the four-year program are the technical program's shorter duration, a four-year degree is greater social prestige, and the two-year degree's concentration in the technical subjects area rather than upon traditional subjects such as history, English, etc.

The time element implies a financial factor from two independent points; first, the two-year program will take one-half as long to complete and as a result, will cost approximately one-half as much; and secondly, the student will be qualified for his occupation two year earlier and be able to improve his financial status that much sooner.

Egermeier[1] found that financial difficulty ranked third in reasons for leaving college. (See Table 1.) This fact lends weight to the premise that places family economics as a factor for selecting technical programs. If, in fact, financial considerations are important as a background characteristic then it is possible to construct a family income continuum on which the lowest income families will not send any children to college, and the highest income families will send all of their children to college. Somewhere in the middle income brackets will be a group of families which select two-year technical programs as the

TABLE I

IMPORTANCE ATTACHED TO THREE COMMON WITHDRAWAL FACTORS APPEARING IN COLLEGE DROPOUT STUDIES

Author of Report	Period	Rank in Importance as a Cause of Withdrawal		
		Financial Difficulty	Academic Difficulty	Change or Loss of Interest or General Dissatisfaction
Snitz	1913-23	First	(not given)	Third
Smith	1919-20	Second	First	Third
Moon	1925-26	First	Fourth	Third
Pope	1930	First	Third	Second
McNelly	1931-36	Second	First	Third
Snyder	1937-39	First	Fourth	Third
Mitchell	1937-39	Second	First	Second
Cummings	1947-48	Third	Second	First
Wiehe	1947-52	Third	First	Second
Koelsche	1948-52	First	Third	Fourth
Iffert	1950-54	First	Third	Second
Brunstetter	1951	Second	First	Second
Mathews	1950-54	Fourth	First	Second
Moore	1955	Second	First	Fourth

Source: John C. Egermeier, Ed.D., Oklahoma State University, "Construction and Validation of a College Dropout Predictor Scale for the Minnesota Counseling Inventory", 1963.

best means, from an economic standpoint, to educate their children. This continuum is indicated by Miller[2] when he says:

> Family incomes of students who select technical programs is significantly lower than those students who select engineering programs.

The continuum theory, of course, ignores many social, ability, and interest factors and is strictly hypothetical; however, it is not completely without merit and is worthy of further investigation.

Milo E. Vann Hall[3] describes the technical student as work oriented and feels so strong about this characteristic that he places it first in his list of technical student characteristics. His indications are that most technical students will have a background of part-time jobs and/or full-time jobs. The third of Vann Hall's characteristics is that the student will be a pragmatist. He likes to take the shortest, most direct and efficient route to get where he is going. Miller states that the successful technical student is independent of other people to a significant degree.[4] If the technical student is, in fact, pragmatic, self-reliant, work-oriented and independently-oriented, the second aspect of the time-financial factor must be the earlier entry into the work force.

The time-pragmatist-independence correlation suggests a desire on the part of the student to be free of parental controls. This is also suggested by the work orientation of the student in that a partial financial independence is achieved. It is not without reason, therefore, to assume that there is some relationship between the student's work experience or personal income and the selection of technical programs.

The second difference in the two types of programs, the social

importance attached to the four-year degree, would seem to indicate that the technical student comes from a background in which this value has less emphasis. Hyman[5] indicates that this background may be a lower socio-economic one when he says, "It is clear that whatever measure of stratification is employed, the lower (socio-economic) groups emphasize college training much less. Table II emphatically underlines the reasoning behind this conclusion.

It seems logical, therefore, to suggest that the technical student comes from a lower "class" background than the student who enrolls in a four-year program and yet a higher class background than the student who choses not to enter any program at all. The relationship of "class" background to selection of programs is further emphasized by Miller[6] who says, "Technical Institute students come from a significantly lower social economic background than engineering students."

The third difference in the two programs, the concentration on technical subjects and especially the lack of emphasis on the traditional subjects, would seem to attract students who have had little or no success with academic subjects in the past. A more optimistic way of expressing this concept is that technical education attracts students who have an interest in technical areas of study but lack interest in the non-technical subjects which have traditionally been included at the post high school level as general education.

This difference in programs indicates two distinct areas of concern. The first area is the lack of success in previous educational endeavors. Vann Hall says, "He (the technical student) may come to us with academic deficiencies for which we must provide solutions" and "he might not

TABLE II

THE DIFFERENTIAL EMPHASIS AMONG ECONOMIC CLASSES UPON COLLEGE EDUCATION

Interviewer's Rating of Economic Level	Per Cent Recomending College Education	Number of Cases
Wealthy and Prosperous	68	512
Middle Class	52	1531
Lower Class	39	856
Occupation		
Professional	74	301
Businessmen and Proprietors	62	421
White Collar Workers	65	457
Skilled Labor	53	392
Semi-skilled Labor	49	416
Domestic	42	194
Farmers	47	417
Non-farm Laborers	35	132
Highest Education Achieved		
Attended College	72	564
Attended High School	55	1411
Attended Grammer School	36	926

Source: H. H. Hyman, "The value Systems of Different Classes: A Social Psychological Contribution to the Analysis of Stratification", Class, Status and Power, Reinhard Bendix and Seymore, Glencoe, Illinois, The Free Press, 1957.

measure up to the many standards we have so long thought sacred."[7] However, this does not mean that the technical student cannot achieve success in the traditional programs from lack of ability or aptitude because Miller[8] states that "The technical student must be at least average in terms of academic ability." The seemingly contradictory views of Miller and Vann Hall are reconciled when it is understood that average in terms of academic ability and average in terms of academic achievement are not necessarily congruent. Motivation plays an extremely important part in conforming grades to ability; when the student is not motivated in the normal way the achievement variable will usually indicate the discrepancy. The technical student may be recognized by a difference in the ability level versus the achievement level as indicated by grade average.

The second area of concern is involved with an interest in technical areas of study usually indicated at the pretechnical level by enrollment in science and math courses. Vann Hall recognized this factor when he says, "He will show a strong aptitude in the mathematical, scientific and mechanical areas."[9] Miller also underlines this point while stating:

> The technical student must have a least an average ability in mathematics and science with a genuine interest in the practical application of these skills to some specific field of technology.

In brief summary, the technical student will be capable to at least the extent of being average in academic ability although he may not, indeed probably will not, have demonstrated this ability in grades achieved, and he will have an aptitude in math and science.

A background factor not yet mentioned is that technical schools

traditionally have no athletic or social programs and as a result will not attract students who place emphasis on these extracurricular aspects of campus life. Vann Hall is very specific when he says:[10]

> We find that our students (technical) will be more interested in the things and theories our campus offers him than the social environment around him. We will discover that he will not involve himself in student activities as much as will other students. . . He will be perfectly willing to let others run out student affairs and be elected to our campus offices. He will take an interest in a club dealing with his curriculum but when it comes to an all college effort, he will let the other guy do it.

A list of technical student characteristics which have been logically supported by past research or generally accepted theory include the following:

(1) The technical student will come from a middle class background in almost every respect.

(Parents' income, education, and occupation)

(2) The technical student will have a background of part-time or full-time jobs.

(3) The technical student will be average or above average in academic ability.

(4) The technical student will not have a high school grade average which conforms to his standard ability measures.

(5) The technical student will have above average ability in mathematics and science.

(6) The technical student will not be socially inclined.

(7) The technical student will tend not to be involved in organized athletics or other extracurricular activities.

These characteristics are recognizable at the high school level

and as such should be included in any survey of possible counseling guides for pretechnical programs.

A second set of characteristics which may be deduced relative to the differences between pretechnical students who continue in technical programs and those pretechnical students who enter related four-year programs includes the following:

(1) Pretechnical students who enter related subject programs will normally have had greater academic success in general education subjects than those pretechnical students who enter technical programs.

(2) Pretechnical students who enter related subject programs will come from higher socio-economic backgrounds than those students who continue in technical programs.

(3) Academic ability levels will be the same for both groups.

(4) Since students who enter related programs remain in the college social climate, a negative social orientation need not be part of this type student's psychological structure.

(5) Athletics involve a time factor which usually does not permit involvement in even a pretechnical program and as a result, most pretechnical students are not participants in organized athletic programs.

(6) Pretechnical students who continue in related programs are not logically included in the work experience factor.

Hypotheses To Be Tested

Two related categories of hypotheses are to be tested in this paper. The first category is composed of hypotheses dealing with the dependence of post high school program choice on certain student background factors, while the second category of hypotheses deals with the dependence of success in technical programs upon student background factors.

Category I

H_1. Student choice of two-year technical programs over four-year related programs is dependent upon parent income.

H_2. Student choice of two-year technical programs over four-year related programs is dependent upon father's occupational level.

H_3. Student choice of two-year technical programs over four-year related programs is dependent upon personal income.

H_4. Student choice of two-year technical programs over four-year related programs is dependent upon father's educational level.

H_5. Student choice of two-year technical programs over four-year related programs is dependent upon high school grade point average.

H_6. Student choice of two-year technical programs over four-year related programs is dependent upon the student's participation in social activities.

H_7. Student choice of two-year technical programs over four-year related programs is dependent upon number of high school math and science courses completed.

Category II

H_8. Success in two-year technical programs is independent of high school grade average.

H_9. Success in two-year technical programs is dependent upon student personal income.

H_{10}. Success in two-year technical programs is dependent upon number of high school math and science courses.

FOOTNOTES

[1]John Charles Egermeier, Ed.D., Oklahoma State University, "Construction and Validation of a College Dropout Predictor Scale for the Minnesota Counseling Inventory." (1963).

[2]A. J. Miller, "A Study of Engineering and Technical Institute Freshmen Enrollees and Dropouts in Terms of Selected Intellective and Non-intellective Factors." (Oklahoma State University, 1966).

[3]Milo E. Vann Hall, "The Technical Education Student", The Journal of Technology, (1967).

[4]A. J. Miller, "Characteristics of the Technical Education Student", The Journal of Technical Education, (1967).

[5]H. H. Hyman, "The Values Systems of Different Classes: A Social Psychological Contribution to the Analysis of Stratification", Class, Status and Power (Glencoe, Illinois, 1957).

[6]A. J. Miller, "Characteristics of the Technical Education Student", The Journal of Technical Education, (1967).

[7]Milo E. Vann Hall, "The Technical Education Student", The Journal of Technology, (1967).

[8]A. J. Miller, "Characteristics of the Technical Education Student", The Journal of Technical Education, (1967).

[9]Milo E. Vann Hall, "The Technical Education Student", The Journal of Technology, (1967).

[10]A. J. Miller, "Characteristics of the Technical Education Student", The Journal of Technical Education, (1967).

[11]Milo E. Vann Hall, "The Technical Education Student", The Journal of Technology, (1967).

CHAPTER III

METHOD

Experimental Design

In the spring of 1967 the initial questionnaire was administered to drafting and electronics high school seniors in the Oklahoma City School System to acquire the background material necessary to this research. This information included socio-economic backgrounds determined by parents' income, father's occupation and father's education, student work experience, academic background and achievement and social participation.

A telephone follow-up was conducted in the fall of 1967 to determine what post high school activities these students were involved in. This information was used to group a subset (sixty-three students) of these students into two categories, students enrolling in two-year technical programs and four-year related courses. The other thirty-eight students did not qualify for these categories.

In the spring of 1968, a second telephone follow-up was conducted to establish which of the students who had entered two-year technical programs were successes as defined by continuation in the same program at the same school in the second semester. At this time, there was only one dropout which did not constitute a significant subsample.

In late spring of 1968, a statistical analysis was conducted using

collected data to test hypotheses (1), (2), (3), (4), (5), (6) and (7). The contingency table method was used to determine if the various program choice classes were dependent on the background factors.

Originally, a second analysis was planned to check hypotheses (8), (9) and (10). Due to the limited dropout subclass this analysis was not possible although a great deal of serendipitus information was collected.

Operational Definitions

Student: A 1967 Oklahoma City High School pretechnical graduate whose technical speciality was drafting or electronics and who enrolled in either a post high school two-year technical program or a post high school four-year related program in the fall of 1967.

Two-Year Technical Program: A post high school training program of two-years duration which trains technicians. Its curriculum is an integrated sequence of college-level courses which lead to an associate of science degree.

Four-Year Related Program: A four-year training program which leads to a baccalaureate degree in electrical engineering, mechanical engineering, industrial engineering, physics, scientific computer programming, architecture or any other field involving the technical skills learned in the two pretechnical programs.

Success In A Technical Program: Success refers to completion of one semester in the technical program and enrollment in the same program at the same school the following semester.

Parental Income: Parental Income refers to the combined income of

both parents for the year 1966. It is measured in $2,000.00 increments as operationalized by the United States Census of 1960. (Question 3)

Father's Occupational Level: Is measured by the United States Census Bureau's occupational scale. (Question 2)

Father's Educational Level: Is measured by the United States Census Bureau's educational scale. (Question 1)

Personal Income: Refers to the student's income from employment other than that employment by relatives. It is measured in terms of accumulated income for 1966 and in increments of $300.00. (Question 7)

High School Grade Point Average: Is measured in increments of .33 on a four point scale. The measurement is expressed in terms of C, C+, B, etc. to facilitate a better understanding of the question. (Question 6)

Student Participation In Social Activities: Is measured by the number of extracurricular clubs, organizations or activities the student participates in plus a bisexual involvement factor. (Questions 8, 9, and 10)

Number of Math and Science Courses: Is measured by adding the number of high school math courses including Algebra I and higher level math courses to the number of high school science courses including Biology and higher level courses such as Chemistry I and II, Physics, Science Seminar, etc. (Questions 4 and 5)

The Sample

The sample used in this survey consists of a subset of 1967 Oklahoma City High School pretechnical graduates from drafting or

electronics programs. The questionnaire was administered on a randomly selected day in the spring of 1967 and all electronics or drafting students present on that day participated. Of the possible 113 participants, this inquiry involved 101.

In the fall of 1967, a telephone followup was conducted to classify these students relative to post high school activities. There were three categories of subsamples which were (1) students who entered two-year technical programs, (2) students who entered four-year related programs and (3) other students who entered the work force, the military, unrelated four-year programs or could not be contacted. The first category contained twenty-four students, the second category contained thirty-nine students, and the third category contained thirty-eight students.

The sixty-three students in categories one and two were used as the sample in the first phase of this project--the investigation of the dependence of background factors and program selection relative to two-year and four-year technically oriented programs.

The twenty-four students in category one were used as the sample for the second phase of this project--the investigation of the dependence of success on three background factors. The results of a telephone follow-up in the spring of 1968 determined that there was only one unsuccessful student in this group.

The Questionnaire

The questionnaire was developed in two stages: (1) an assessment of the information needed to test the hypotheses and (2) the formulation

and testing of questions to obtain this information.

An examination of the hypotheses indicated five areas of interest. These were, (1) the socio-economic background of the student, (2) the personal income of the student, (3) the math and science background of the student, (4) the student's high school grade average, and (5) the social participation of the student.

The information required and suggested question formats were submitted to a group of seven students enrolled at the Oklahoma City Area Vocational Technical Center (High School) who developed questions to achieve the goal of collecting the necessary information while being expressed in a high school student's vocabulary. When the questions were formulated to this group's satisfaction, they were administered to a second group of twenty-two students from the same school as a test of clarity of meaning. This second group made suggestions for the improvement of the questionnaire which were evaluated and selectively incorporated. The questionnaire was completed in the late winter of 1966-67.

The use of Oklahoma City Area Vocational Technical Center students to develop the questionnaire evolved from previous communication problems encountered by researchers at the high school level. All twelve of the Oklahoma City high schools were represented by at least one member in at least one of the two groups. This was the result of the Center's half-day policy with the student spending the second half of the day at a home or parent school.

Three of the ten scales used on the questionnaire are the United States Census Bureau's operational definition of socio-economic

background. These are parents' income, father's occupation and father's education.

The four scales involving math and science background, grade average and student income were simple continum scales where the problem was interval definition.

Math and science background was measured in terms of number of courses completed at the high school level in math and science.

Grade average was expressed in intervals of .33 on a four point grade scale. To facilitate a better understanding, it was felt that this interval definition should be expressed as C, C+, B-, B, etc.

Student income was defined in increments of $200.00 from $100.00 to $700.00, $300.00 from $700.00 to $1,000.00, and at $500.00 increments from $1,000.00 up. This breakdown was suggested by the students who participated in the questionnaire design as representing certain stages of freedom from parental control. It was felt that a three hundred dollar income represented personal items cost, seven hundred dollars represented social independence, one thousand dollars represented tranportation expense and levels above this figure represented relative freedom from parental control.

In the area of social participation, the students felt that Oklahoma City High School students had three measurable areas in which to express an attitude. These were athletic achievement, extracurricular organization membership and dating habits.

Athletic achievement was measured in terms of letters awarded for outstanding performance. Although athletic participation is not a social factor in the narrowest sense, a demonstrated proficiency was

felt to indicate a certain prestige factor and, hence, influence the social attitude.

Oklahoma City high schools offer a wide variety of extracurricular clubs and activities for social expression. A measure of participation in these organizations was established by membership count.

There are at least six distinct levels of bisexual involvement in Oklahoma City high schools--married, engaged, going steady, dating frequently, dating infrequently and not dating. Dating frequently and dating infrequently are relative terms and are definitely expressed in dating more than once a week, dating once a week and dating less than once a week.

The composite of these factors comprises the social participation factor.

Collection Procedure

Mr. Bill Laiman, technical consultant for the Oklahoma City Board of Education, distributed the questionnaires to the drafting and electronics instructors in the System in the spring of 1967 with instructions to administer them on a specified date and return the results the following day. When he had collected the completed questionnaires, they were given to this researcher.

Follow-Up Procedures

In the fall of 1967, a telephone follow-up was made in which the student was asked if he had enrolled in a post high school educational program and if he had, what type of program. With this information,

the subsamples described in "The Sample" were formed.

A second follow-up was conducted by telephone in the spring of 1968 in which the student was asked if he was still enrolled in the same program. As indicated in "The Sample", the follow-up found that there were an insufficient number of dropouts to form a significant subgroup.

Statistical Method

Since the data was grouped according to two criteria, program choice and level of a particular factor, and it was determined that a dependence analysis was needed, the contingency table method was used. This method was especially applicable because the data was qualitative and had not been established as normally distributed.

This method requires that one criteria form table rows and the other table columns. A cell of the table is formed by the intersection of a particular row and a particular column. The content of a cell is determined by counting the members of the sample that belong in that row and that column. This value is called the actual value of the cell.

The probability that any random element of the sample will belong in a selected cell is equal to the probability that the element belongs to that row multiplied by the probability that the element belongs to that column. For instance, if there are 100 elements in the sample and 36 are in row R and 10 are in column C, then the probability that the element is in row R is .36 and the probability that the element is in column C is .10. The probability that the element is in

cell (R,C) is .36 times .10 or .036.

The expected value or number of elements in a cell is determined by multiplying the number of elements in the sample by the probability or an element being in the cell. In the example above the expected value of cell (R,C) would be 3.6 elements. Obviously, there is no way that there can be 3.6 elements in a cell, but on the basis of statistical theory this figure would be expected.

The difference between the expected value and the actual value squared and divided by the expected value is defined as the contribution of the cell.

The sum of all cell contributions is defined as the Chi-square value of the criteria comparison. Using this value and the degree of freedom (number of rows minus one multiplied by the number of columns minus one), the probability of dependence or independence of one factor on another can be determined. In this work, a ninety-five percent probability was considered significant.

CHAPTER IV

RESULTS OF THE INVESTIGATION

Introduction

The results of this investigation are reported in two areas as follows: program choice between four year related programs and two year technical programs as related to socio-economic, academic, and social participation factors and success in a technical program as defined by continuation in the same program at the same school in the second semester of 1967-1968 as related to these same background factors.

Analysis of Program Choice Hypotheses

The number of subjects initally choosing a two year technical program totaled 24, while those choosing a four year related program numbered 38.

The hypothesis test results are divided into four areas of interest, (a) the chi square approximation and disposition of hypothesis, (b) a table giving actual cell values and expected cell values, (c) a graph depicting both number of students entering four year programs and the number of students entering two year programs on the Y axis and the value of the particular factor on the X axis, and (d) a graph depicting both the actual values and expected values

of students entering two year technical programs versus factor levels.

Hypothesis I

Student choice of two year technical programs over four year related programs is dependent upon family income level.

Null Hypothesis

Student choice of two year technical programs over four year related programs is independent of family income level at the .05 level of significance.

Results

Chi square approximation (d.f. = 5) = 14.85; a probability of less than .05 that the samples were independent.

Disposition of Hypothesis

Null: Rejected

Alternative: Confirmed

TABLE III

NUMBER OF STUDENTS PER FAMILY INCOME LEVEL -- ACTUAL VALUE AND EXPECTED VALUE

Family Income Level	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
Under 5000	12	9.80	4	6.20
5000-6999	4	7.90	9	5.10
7000-8999	4	3.10	1	1.90
9000-11999	0	3.10	5	1.90
12000-15000	8	6.10	2	3.90
Over 15000	9	6.10	1	3.90

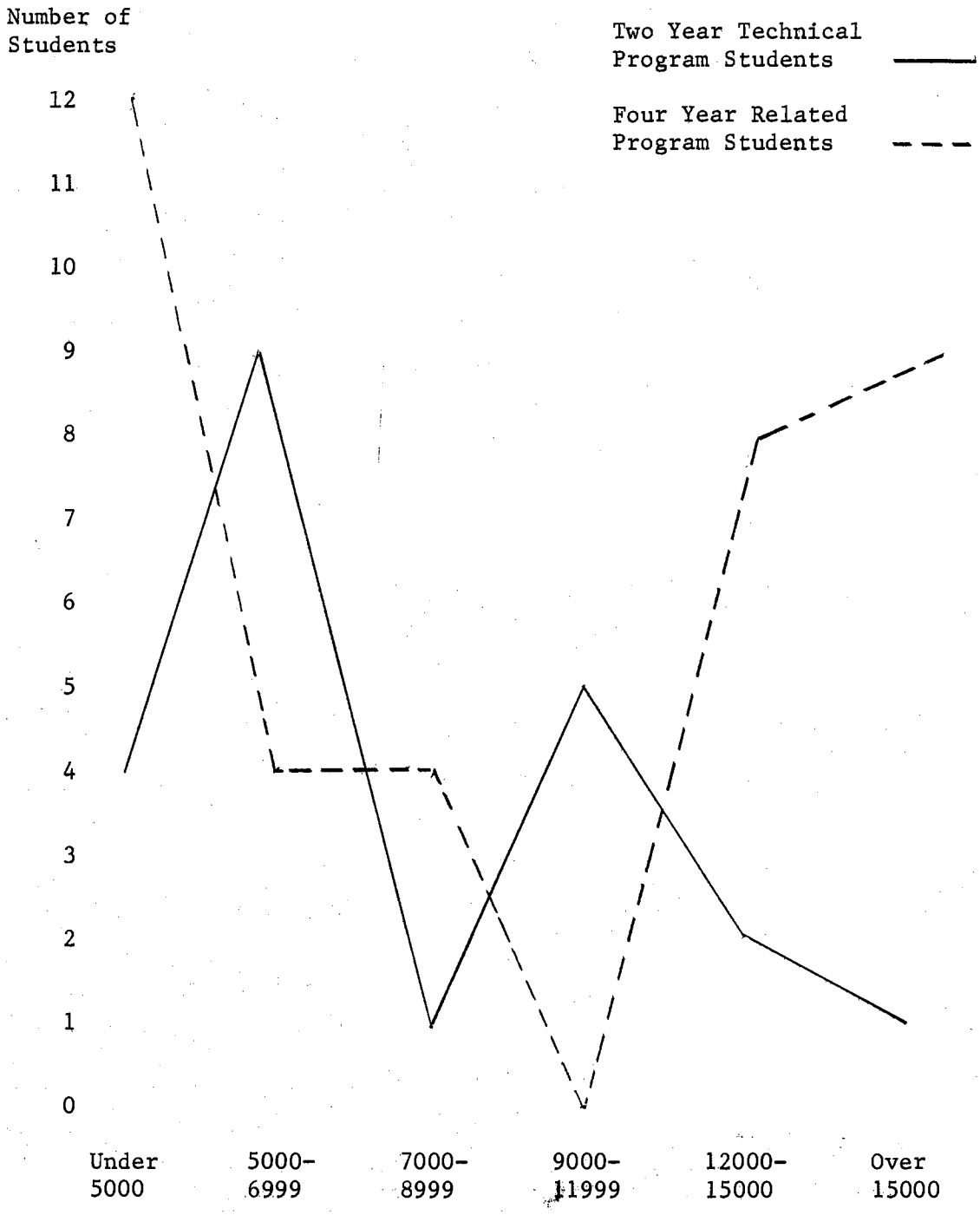

Figure 1. Family Income Versus Number of Students in Two Year Technical Programs and Number of Students in Related Four Year Programs

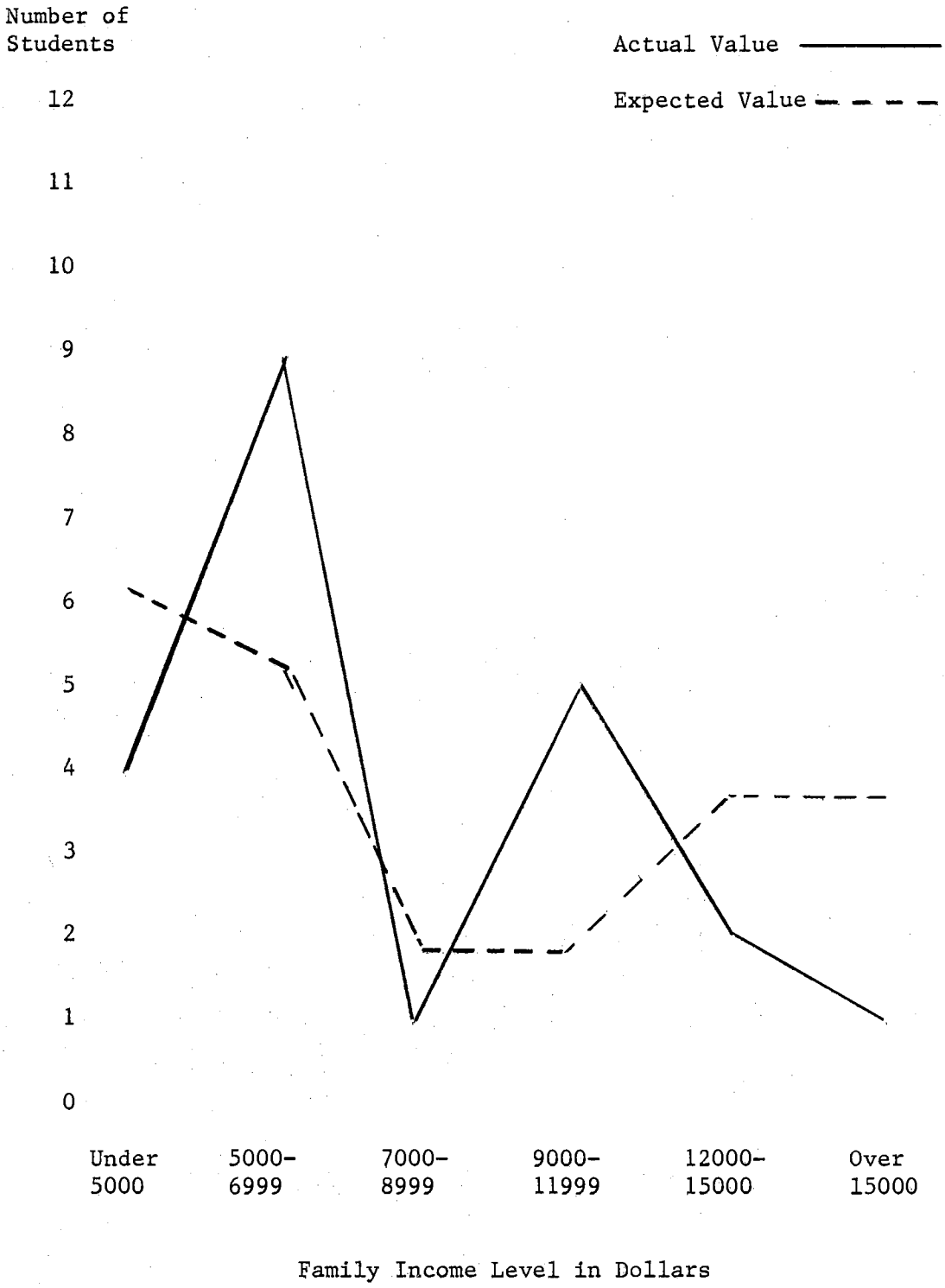

Figure 2. Expected Value of Family Income Level Versus Actual Value for Two Year Technical Program Students

Hypothesis II

Student choice of two year technical programs over four year related programs is dependent upon father's occupational level.

Null Hypothesis

Student choice of two year technical programs over four year related programs is independent of father's occupational level at the .05 level of significance.

Results

Chi square approximation (d.f. = 7) = 12.41; a probability of greater than .05 that the sample was independent.

Disposition of Hypothesis

Null: Confirmed

Alternate: Rejected

TABLE IV

NUMBER OF STUDENTS PER FATHER'S OCCUPATIONAL LEVEL -- ACTUAL VALUE AND EXPECTED VALUE

Father's Occupational Level	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
Professional, Technical	0	2.45	4	1.55
Manager, Official	3	3.06	2	1.94
Clerical	3	1.84	0	1.16
Sales Workers	1	1.84	2	1.16
Craftsmen, Foremen	16	15.94	10	10.06
Operative	8	6.74	3	4.24
Service Worker	5	3.06	0	1.94
Laborer	2	3.06	3	1.94

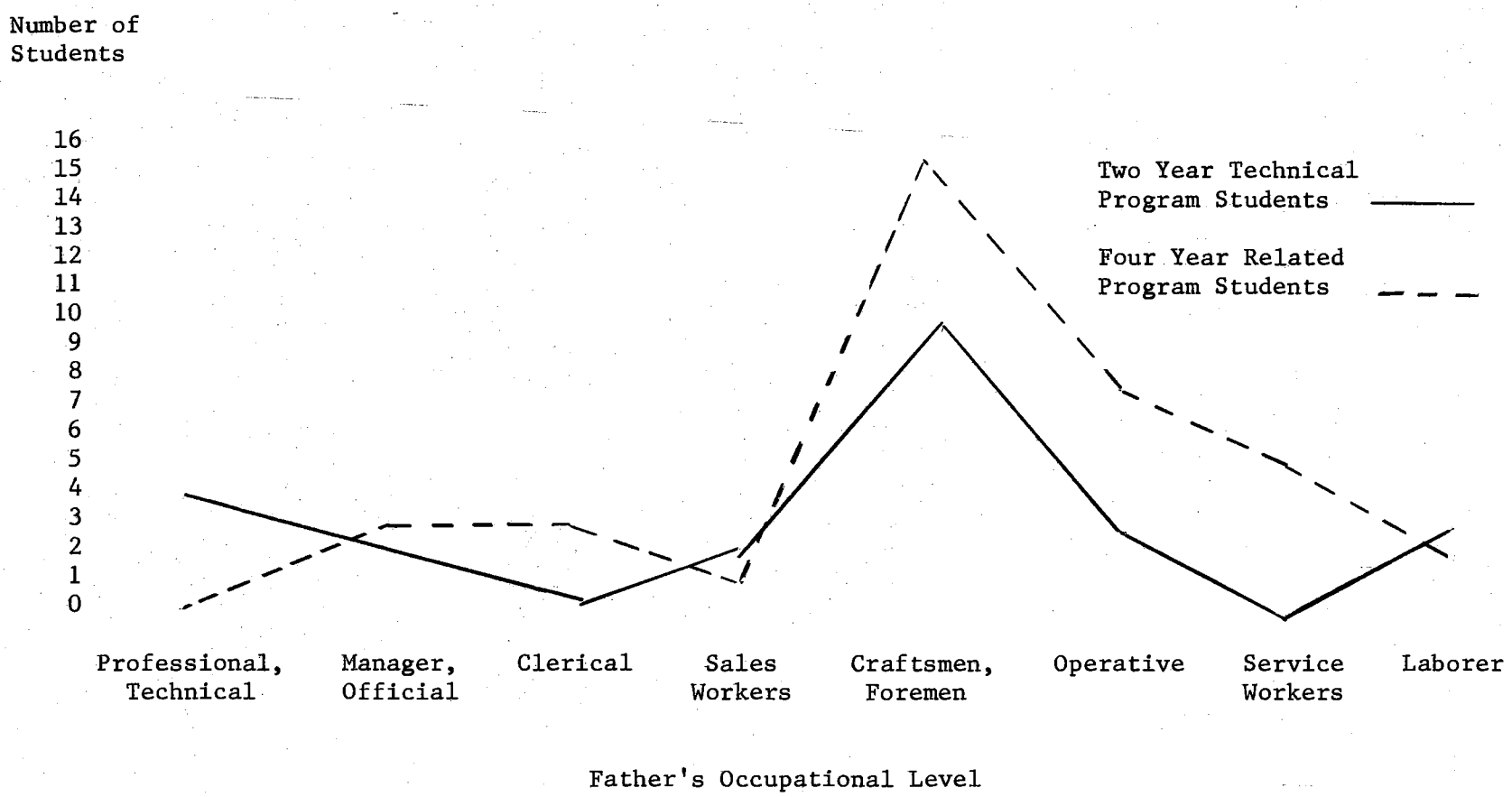

Figure 3. Father's Occupational Level Versus Number of Students in Two Year Technical Programs and Number of Students in Related Four Year Programs

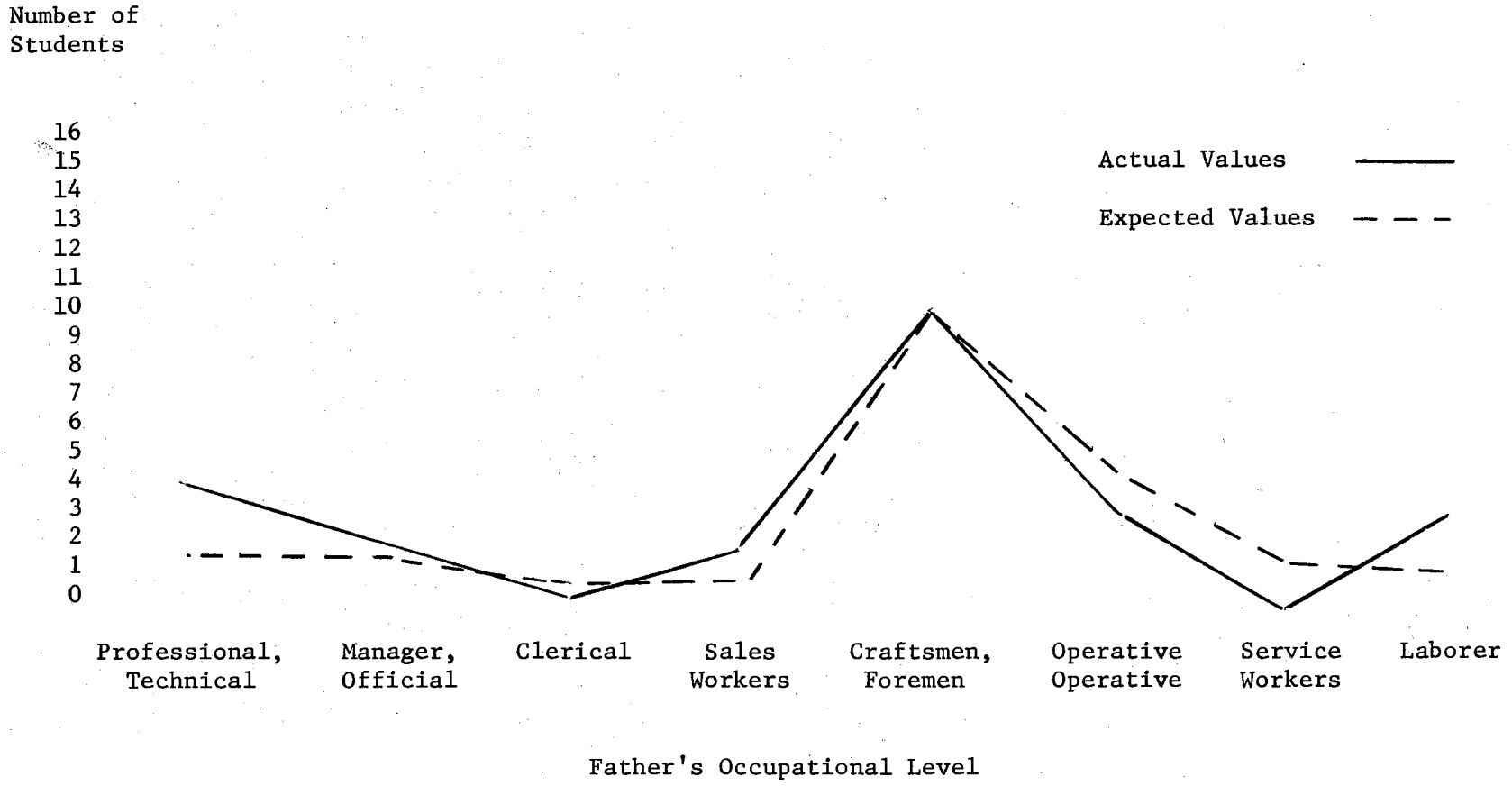

Figure 4. Expected Values of Father's Occupational Level Compared with Actual Value for Two Year Technical Program Students

Hypothesis III

Student choice of two year technical programs over four year related programs is dependent on father's educational level.

Null Hypothesis

Student choice of two year technical programs over four year related programs is independent of father's educational level at the .05 level of significance.

Results

Chi square approximation (d.f. = 7) = 5.78; a probability of greater than .05 that the samples were independent.

Disposition of Hypothesis

Null: Confirmed

Alternate: Rejected

TABLE V

NUMBER OF STUDENTS PER FATHER'S EDUCATIONAL LEVEL -- ACTUAL VALUE AND EXPECTED VALUE

Father's Educational Level	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
7th-8th	3	4.29	4	2.71
9th-10th	3	3.07	2	1.93
11th-12th	1	2.46	3	1.54
High School Graduate	16	13.73	8	10.27
College	8	5.53	1	3.47
College Graduate	2	2.46	2	1.54
Graduate School	2	2.46	2	1.54

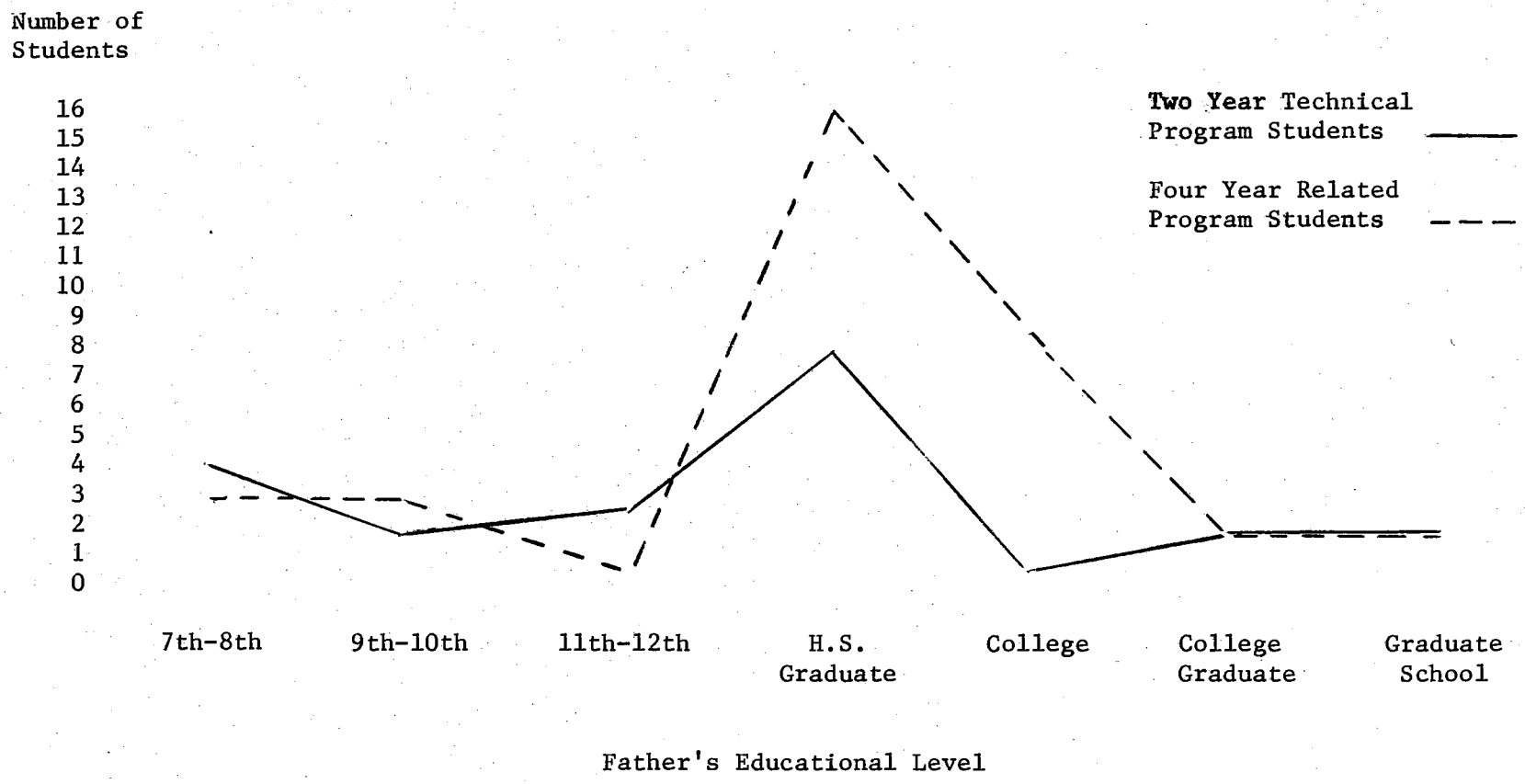

Figure 5. Father's Educational Level Versus Number of Students in Two Year Technical Programs and Number of Students in Four Year Related Programs

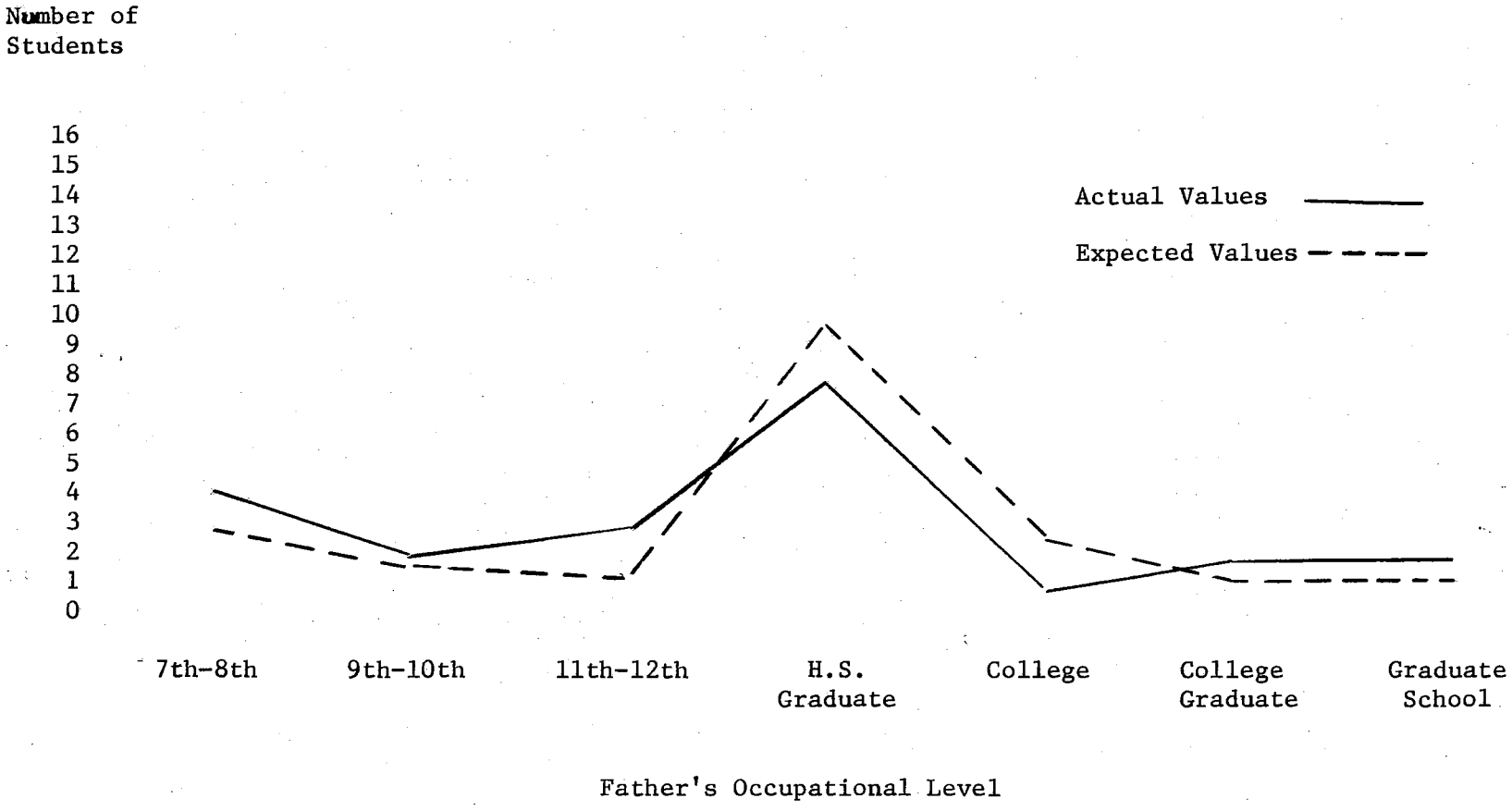

Figure 6. Expected Value of Father's Educational Level Compared to Actual Value for Students in Two Year Technical Programs

Hypothesis IV

Student choice of two year technical programs over four year related programs is dependent on student's personal income.

Null Hypothesis

Student choice of two year technical programs over four year related programs is independent of student's personal income at the .05 level of significance.

Results

Chi square approximation (d.f. = 7) = 7.25; a probability of greater than .05 that the samples were independent.

Disposition of Hypothesis

Null: Confirmed

Alternate: Rejected

TABLE VI

NUMBER OF STUDENTS BY PERSONAL INCOME -- ACTUAL AND EXPECTED VALUES

Student Personal Income	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
100 or Less	3	2.95	2	2.05
101-300	4	3.78	2	2.22
301-500	1	2.65	3	1.35
501-700	6	6.85	5	4.15
701-1000	10	7.48	2	4.52
1001-1500	6	5.61	3	3.39
1501-2000	8	8.10	5	4.90
Over 2000	0	.62	1	.38

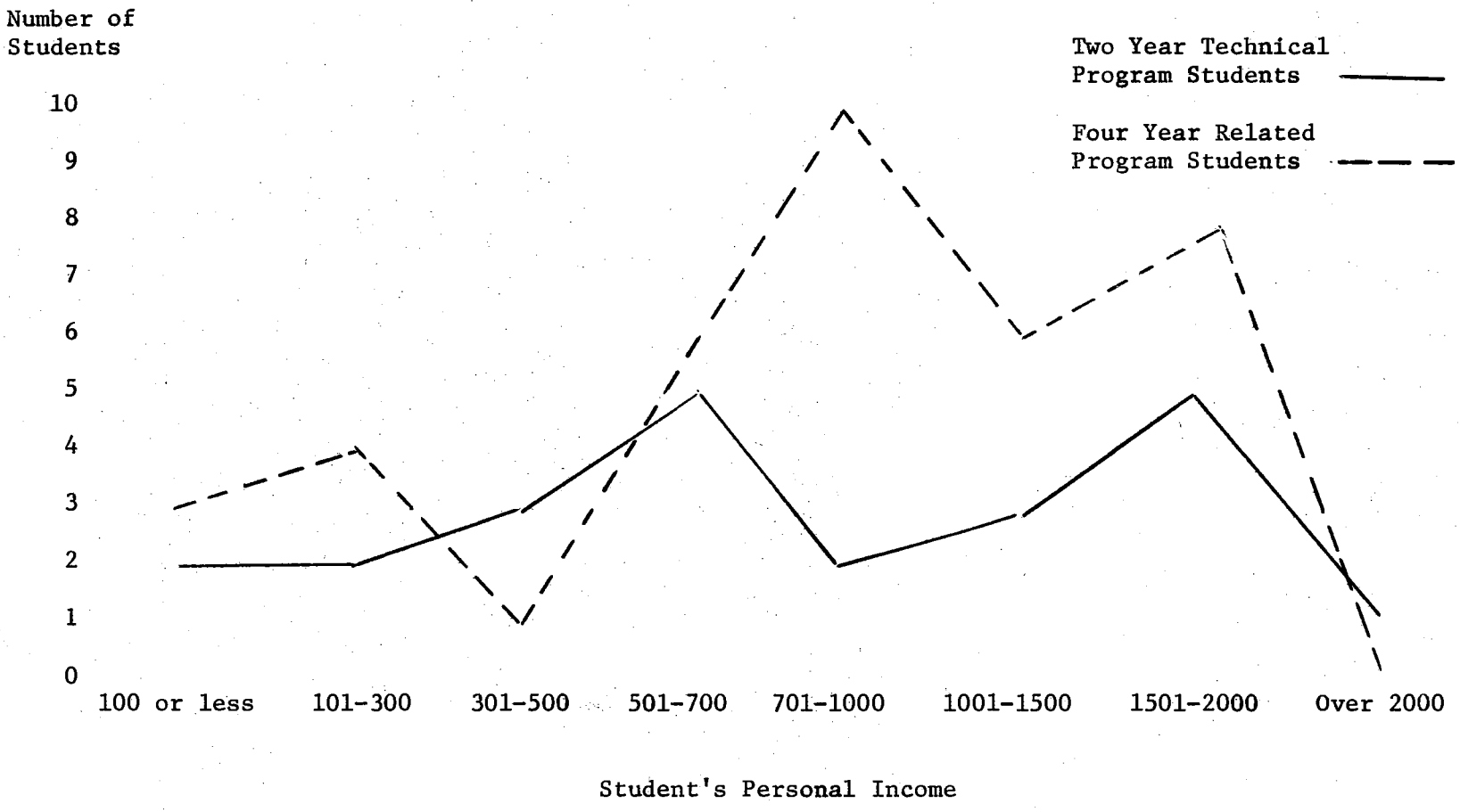

Figure 7. Student's Personal Income Versus Number of Students in Two Year Technical Programs and Number of Students in Four Year Related Programs

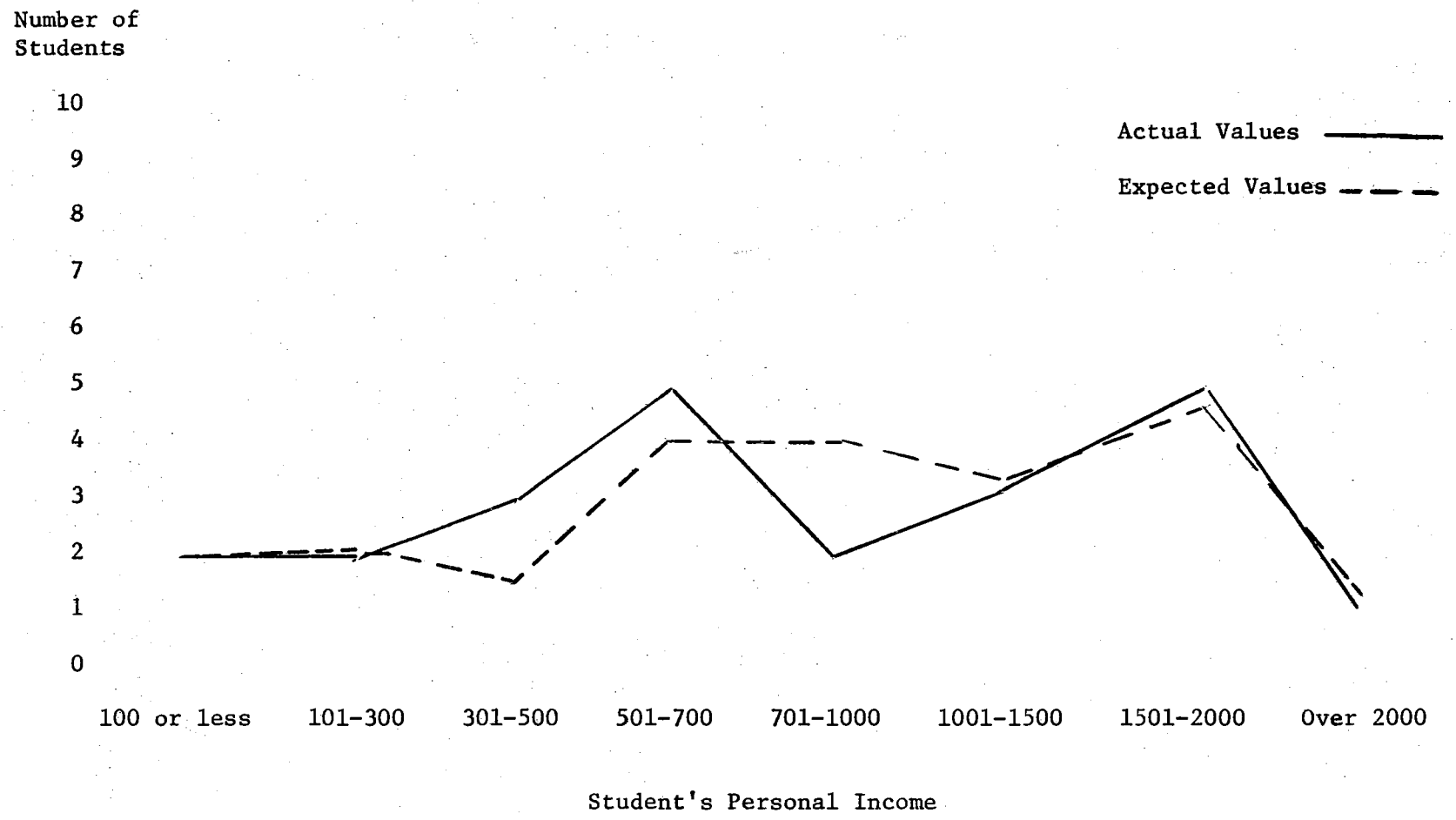

Figure 8. Expected Value of Student's Personal Income Compared with Actual Value for Students in two Year Technical Programs

Hypothesis V

Student choice of two year technical programs over four year related programs is dependent on student's high school math and Science background.

Null Hypothesis

Student choice of two year technical programs ofer four year related programs is independent of high school math and science background at the .05 level of significance.

Results

Chi square approximation (d.f. = 5) = 17.66; a probability of less than .05 that the samples were independent.

Disposition of Hypothesis

Null: Rejected

Alternate: Confirmed

TABLE VII

NUMBER OF STUDENTS PER NUMBER OF MATH AND SCIENCE COURSES -- EXPECTED AND ACTUAL VALUES

Number of Math and Science Courses	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
5 or less	3	6.45	8	4.55
6	2	3.53	4	2.47
7	4	4.10	3	2.90
8	6	7.62	7	5.38
9	9	5.28	0	3.72
10	10	7.03	2	4.97

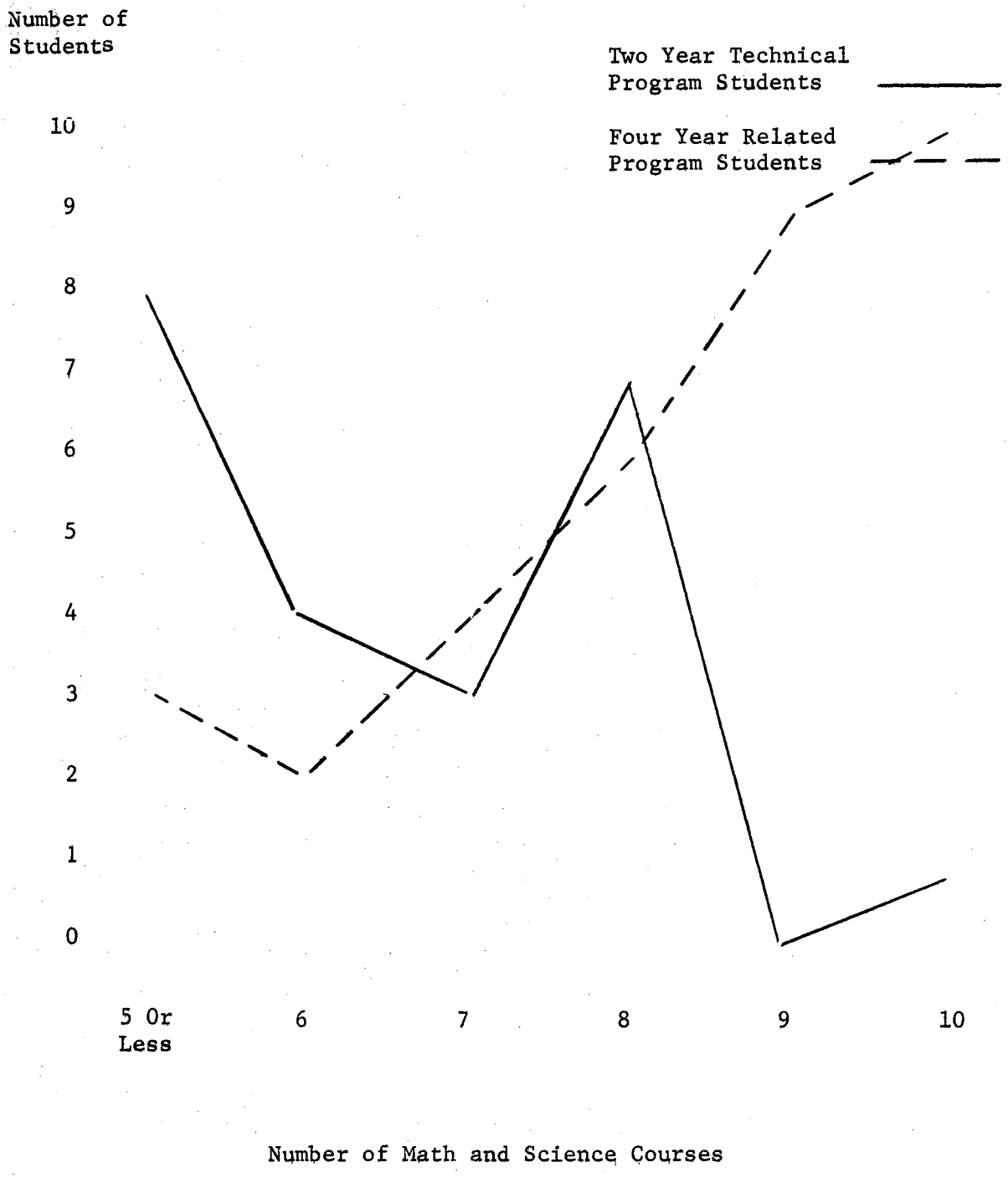

Figure 9. Number of High School Math and Science Courses Versus Number of Two Year Technical Program Students and Number of Four Year Related Program Students

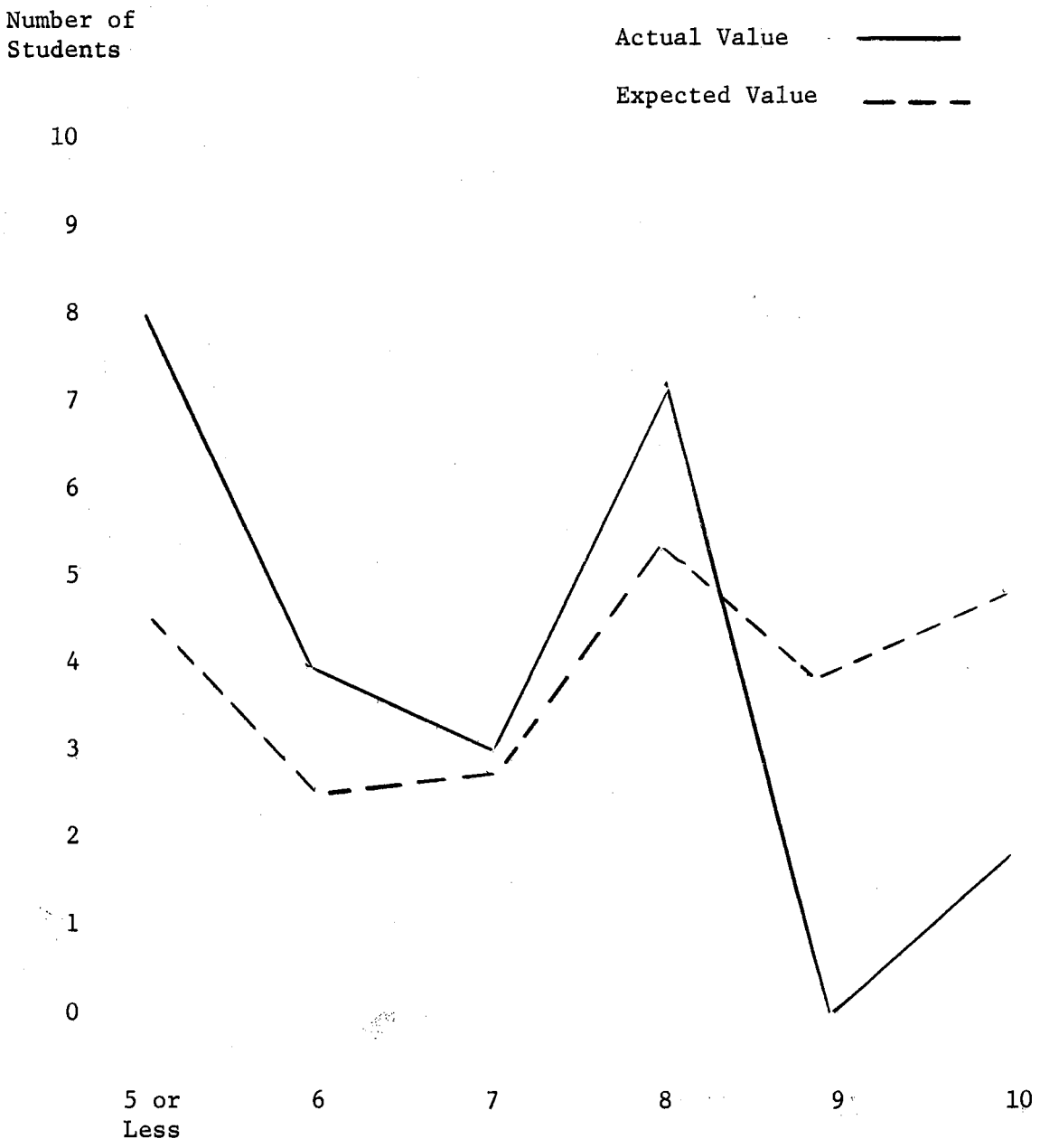

Figure 10. Expected Value of Number of High School Math and Science Courses Compared with Actual Value for Two Year Technical Program Students

Hypothesis VI

Student choice of two year technical programs over four year related programs is dependent on student's high school grade average.

Null Hypothesis

Student choice of two year technical programs over four year related programs is independent of student's high school grade average at the .05 level of significance.

Results

Chi square approximation (d.f. = 7) = 13.41; a probability of greater than .05 that the samples were independent.

Disposition of Hypothesis

Null: Confirmed

Alternate: Rejected

TABLE VIII

NUMBER OF STUDENTS BY HIGH SCHOOL GRADE AVERAGE -- ACTUAL AND EXPECTED VALUES

High School Grade Average	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
D+	0	.61	1	.39
C-	1	1.23	1	.77
C	2	5.51	7	3.49
C+	6	6.13	4	3.87
B-	5	6.68	6	4.32
B	10	7.29	2	4.71
B+	8	6.13	2	4.87
A-	6	4.29	1	2.71

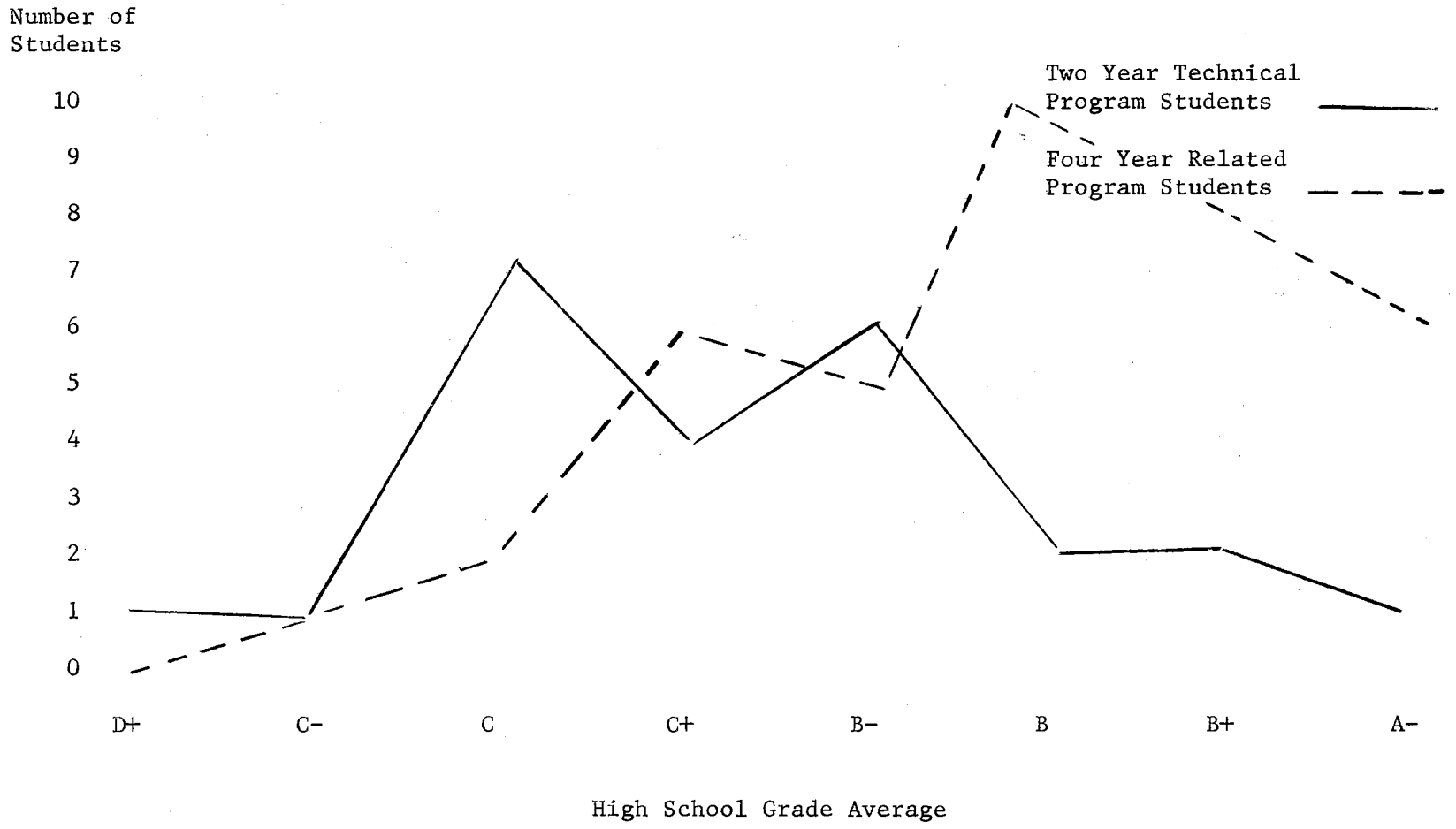

Figure 11. High School Grade Average Versus Number of Students in Two Year Technical Programs and Number of Students in Four Year Related Programs

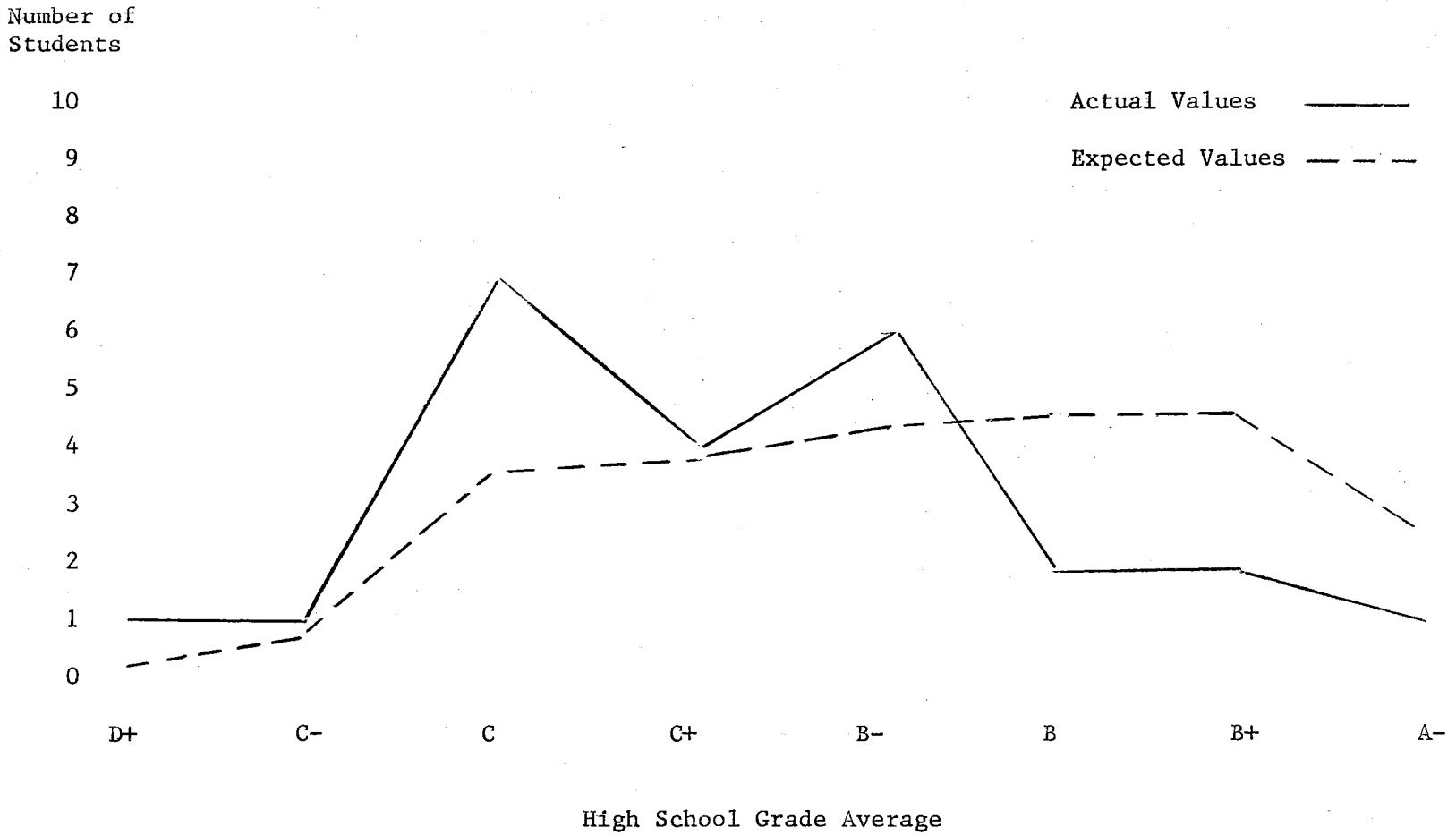

Figure 12. Expected Value of High School Grade Averages Compared with Actual Value for Students in Two Year Technical Programs

Hypothesis VII

Student Choice of two year technical programs over four year related programs is dependent upon a social participation factor.

Null Hypothesis

Student choice of two year technical programs over four year related programs is independent of a student's social participation factor at the .05 level of significance.

Results

Chi square approximation (d.f. = 4) = 1.98; a probability of greater than .05 that the samples were independent.

Disposition of Hypothesis

Null: Confirmed

Alternate: Rejected

TABLE IX

NUMBER OF STUDENTS BY SOCIAL PARTICIPATION FACTOR -- ACTUAL AND EXPECTED VALUES

Social Participation Factor	Students in Related Programs		Students in Technical Programs	
	Actual Cell Value	Expected Cell Value	Actual Cell Value	Expected Cell Value
High Social Participation	4	5.61	5	3.99
Medium High Social Participation	11	9.58	6	7.42
Medium Low Social Participation	11	10.71	8	8.29
Low Social Participation	5	5.64	5	4.36

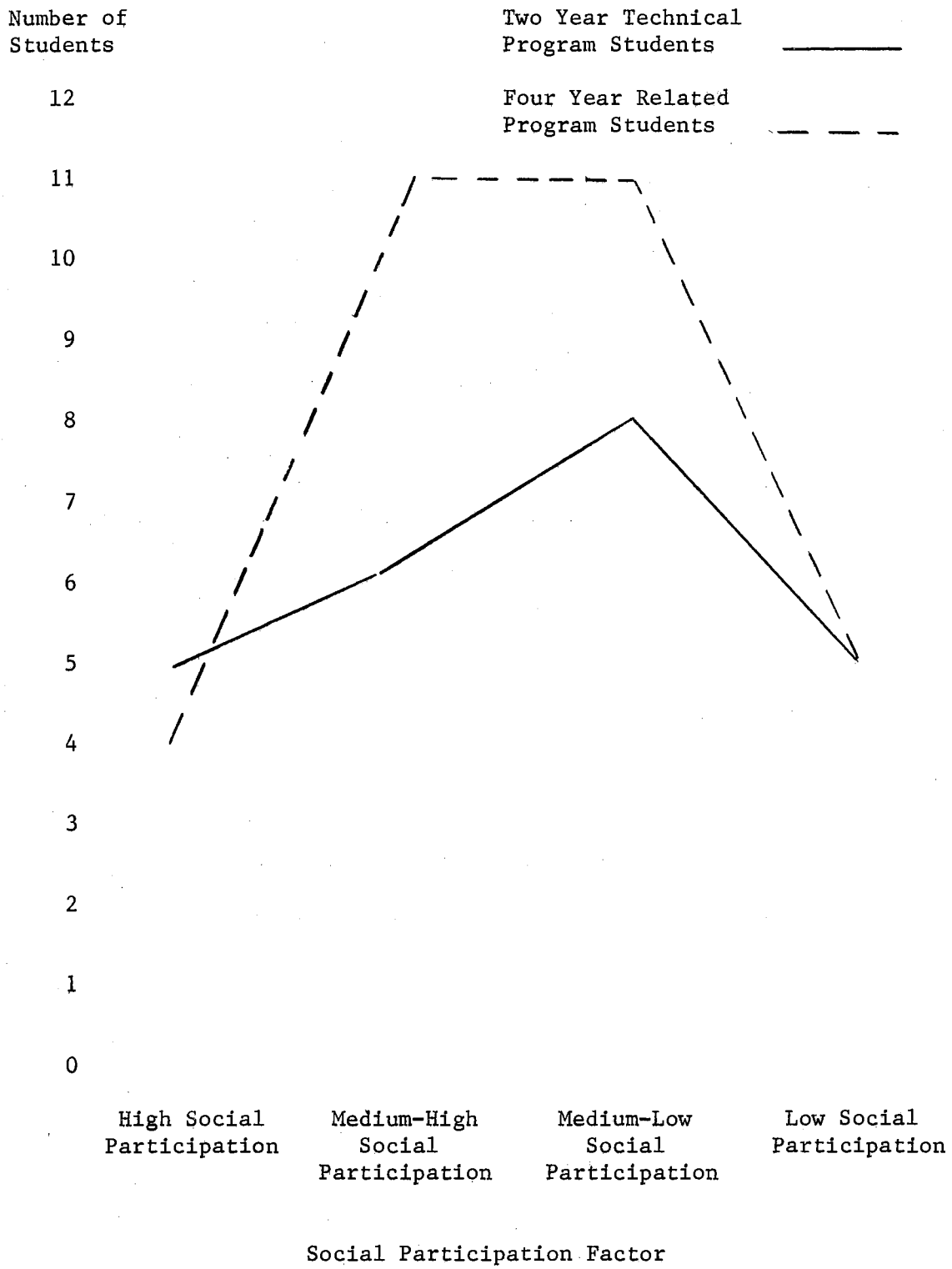

Figure 13. Social Participation Factor Versus Number of Students in Two Year Technical Programs and Four Year Related Programs

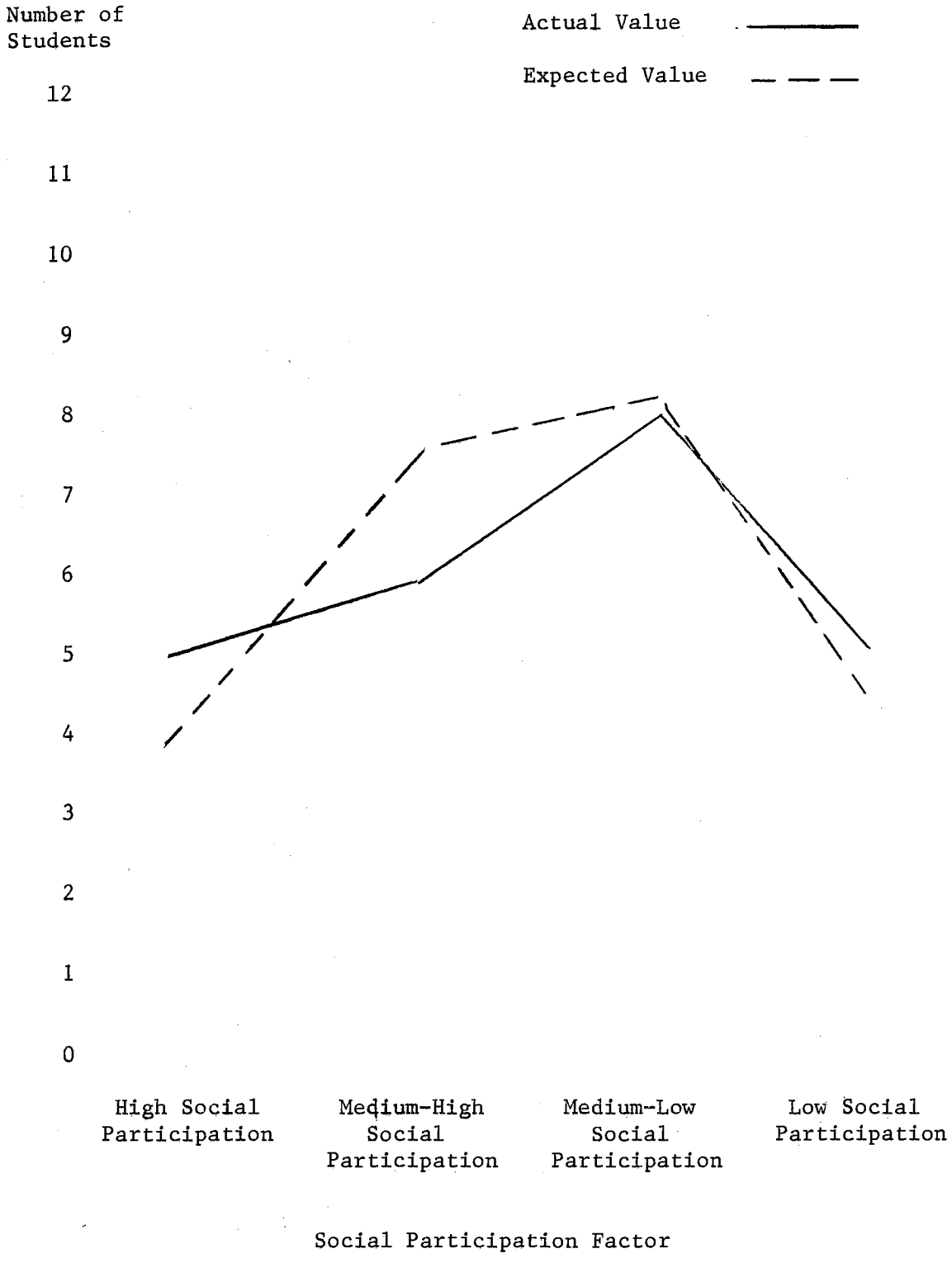

Figure 14. Expected Value of Social Participation Compared with Actual Value for Students in Two-Year Technical Programs

Analysis of Success Hypotheses

With only one dropout in the two year technical program sample, it was not possible to evaluate characteristics of successful students versus unsuccessful students. However, the low dropout rate did indicate some important unexpected findings. These are discussed later in this paper under the heading "Serendipitus Findings".

CHAPTER V

FINDINGS AND RECOMMENDATIONS

Summary

A list of student characteristics which were rejected as indicators of two year technical program preference includes (1) student work experience as indicated by student's personal income, (2) father's occupation, (3) father's education, (4) high school grade average and (5) social participation.

Of these five, high school grade average was the one factor that closely approached the acceptance level. The deviation from expected values for this factor was in the predicted pattern. The other four characteristics which were not accepted indicated less significance than was acceptable and in several cases deviated in an unexpected manner.

Two characteristics were accepted as significant indicators of two year technical program preference. These were high school math and science background as measured by number of math and science courses taken in high school and parent's income.

Using the scale originally designed, math and science background showed a clear indication to deviate from expected values in the manner predicted, i.e. the fewer the number of math and science courses, the greater the probability of two year technical program selection.

A scale adjustment was necessary to establish a clear pattern of deviation for parent's income relative to expected values. This adjustment grouped the income levels into three categories; lower income families, middle income families and higher income families. With this regrouping, it became apparent how parent's income was related to program choice. Figure 15 graphically indicates the theory that preference of two-year technical programs over four-year related programs is influenced by money available to finance education.

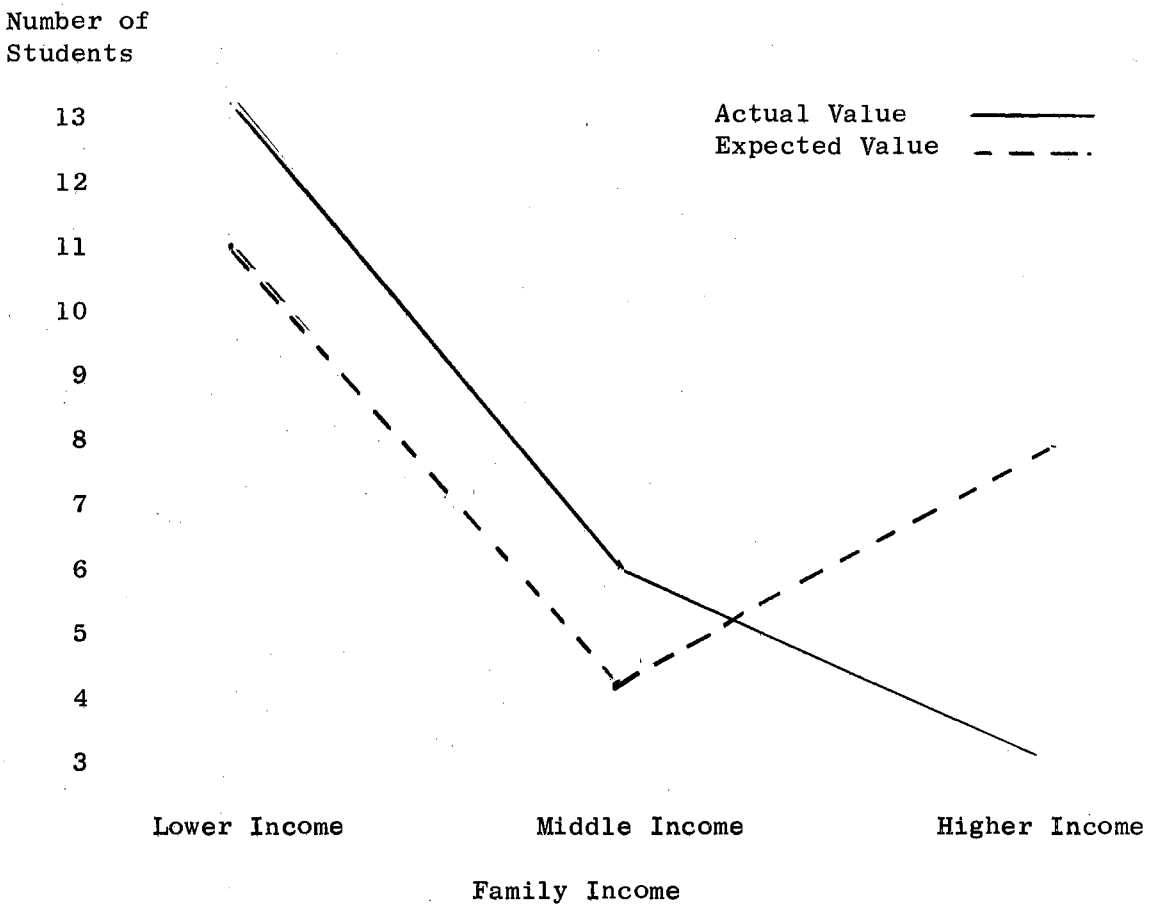

Figure 15. Adjusted Comparison of Two Year Technical Program Student's Actual Family Income Versus Expected Family Income

Serendipitus Findings

Possibly the two most important findings of this paper were unexpected. The percentage of students entering post high school education from the Oklahoma City high school technical programs was 23% higher than the Oklahoma average from all high school programs (65% versus 88%). Also, the percentage of dropouts from two year technical programs among the Oklahoma City high school technical program graduates was 20% lower than the Oklahoma average two year technical program dropout rate (25% versus 4% for the first year).

Conclusions

The deviations of the findings from the projected hypotheses in five of seven cases indicates at least one of three possibilities. First, the dynamics of American society have outdated research almost as fast as it is published; second, the background research in this paper is not valid; and third, the Oklahoma City sample has a powerful influence which effects certain program choice factors significantly.

It is the third possibility which seems most likely. Oklahoma City's attitudes are strongly effected by the major economic influences in the local area. Because most of the industry in Oklahoma City is technician oriented (as opposed to labor oriented) there is a large block of technicians living in the metropolitan area. Many people with professional training are working in technician's jobs and it is not uncommon for technicians to have a larger income than professionals (electronic technicians versus school teachers).

Reasons to reject the first two possibilities are (1) the past research covers different time intervals without indicating any significant trend changes and (2) the background research for this paper is broad based and rests on papers done by educators who concur in the validity of the hypotheses developed.

If an attitude of benevelance does exist in Oklahoma City relative to technical occupations, it could conceivably distort the influence of father's occupation and education. The influence would be less obvious in social participation factors and student work habits but still could conceivably distort the relationships with two year technical program selection. Two factors which would not be influenced would be student attitude toward unrelated math and science and parent's ability to finance education.

For the purpose of counseling in Oklahoma City, it is significant that student math background and parent income are factors in selection of post high school educational programs.

The high school technical program student also seems to be more mature than his counterpart in the liberal education program by his early selection of a career field and his ability to complete the post high school program selected.

Further, it seems to be a mistake to enroll students who cannot succeed in post high school education in high school technical programs because the majority continue education after high school.

Finally, the high school technical programs in Oklahoma City are serving the purpose stated by the school system, i.e. preparing students to enter advanced technical training (both two and four year).

Recommendations

The recommendations resulting from this research are classified into two categories. The first is recommendations for counseling policy changes in the Oklahoma City School System and the second is recommendations for future research.

Recomendations for Counseling Policy Changes

1. Since parent's income is a factor in selecting post high school educational programs, a student's financial background should be examined before recommending any high school technical program.
2. Since 88% of the students who enter high school technical programs seek post high school education at the college level (two or four year), high school technical programs should not be recommended to students who are not capable of college work.
3. Technical programs should be examined as an alternative for students who have a high math and science aptitude and who have a relatively low performance level in traditional math and science courses.

Recommendations for Future Research

1. This longitudinal study should be continued to determine if:
   a. the dropout rate remains low for the second year of the two year technical program students.
   b. the two year technical program students who graduated from high school technical programs have a higher employment rate in the field of their training than two year technical program students who did not graduate from a high school technical program.

2. A study of students in two year technical programs who have a high math and science aptitude and who have performed at a relatively low level in traditional math and science courses at the high school level should be initiated.
3. An examination of the completion rate of high school technical program graduates versus non-high school technical program graduates in two year post high school technical programs should be initiated.

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APPENDIX A

THE QUESTIONNAIRE

STUDENT INFORMATION SHEET

Name (Print):_____
Last Name First Name Middle Name

School:_____

Age: (Check one)____15 ____16 ____17 ____18 ____19 ____Other

Sex: (Check one) ____Male ____Female

Address: _____

Phone Number:_____

Parent or guardian's name (print)_____

What technical course are you now enrolled in?

_____

Education of Father: (Please check the highest level of education that was attained by your father.)

(1) ____6th grade or less

(2) ____7th - 8th grade

(3) ____9th - 10th grade

(4) ____11th - 12th grade

(5) ____Graduated from high school

(6) ____Some college but no degree

(7) ____Earned a college degree but no additional graduate or professional degree

(8) ____Had some graduate work or earned a graduate or professional degree

Occupation of Father: (If deceased, indicate his occupation at time of death.)

(1) ____ Professional, technical, or kindred worker. (Includes accountants, engineers, lawyers, personnel workers, technicians, etc.)

(2) ____ Manager, official, proprietor, farm manager.

(3) ____ Clerical and kindred workers. (Includes bookkeepers, cashiers, clerks, storekeepers, etc.)

(4) ____ Sales worker.

(5) ____ Craftmen, foreman, and kindred workers. (Includes carpenters, electricians, machinists, printers, etc.)

(6) ____ Operatives and kindred workers. (Includes apprentices, assemblers, truck drivers, deliverymen, welders, etc.)

(7) ____ Service workers, including private household. (Includes janitors, guards, watchmen, etc.)

(8) ____ Laborer, including farm.

(9) ____ Other (Please specify) _____

Approximate annual income of parents or guardians in 1966.

(1) ____ Under $5,000

(2) ____ $5,000 to $6,999

(3) ____ $7,000 to $8,999

(4) ____ $9,000 to $11,999

(5) ____ $12,000 to $15, 000

(6) ____ Above $15,000

Math Background. (Check the math courses you have had or are now taking.)

(1) ____ Algebra I

(2) ____ Geometry

(3) ____ Algebra II

(4) ____ Trig

(5) ____ Advanced Math

(6) ____ Other (Please specify)_____

Science background. (Check the number of science courses you have had including those you are now enrolled in.)

(1) ____ None

(2) ____ One

(3) ____ Two

(4) ____ Three

(5) ____ Four

(6) ____ Five

High school grade average. (Please check your average high school grade.)

(1) ____ D-

(2) ____ D

(3) ____ C-

(4) ____ C

(5) ____ C+

(6) ____ B-

(7) ____ B

(8) ____ B+

(9) ____ A-

Your approximate annual income for 1966. (Money that you have earned yourself from employers other than parents or guardians.)

(1) ____ None

(2) ____ $100 or less

(3) ____ $101 to $300

(4) ____ $301 to $500

(5) ____ $501 to $700

(6) ____ $701 to $1,000

(7) ____ $1,001 to $1,500

(8) ____ $1,501 to $2,000

(9) ____ $2,001 or more

Organized athletics. (Check the number of school sports that you have lettered in.)

(1) ____ None

(2) ____ One

(3) ____ Two

(4) ____ Three

(5) ____ Four

(6) ____ Five

(7) ____ More than five

Extracurricular clubs and activities. (Check the number of clubs and/or activities that you participate in. This will include FFA, FTA, FBLA, Band, Choir, etc.)

(1) ____ None

(2) ____ One

(3) ____ Two

(4) ____ Three

(5) ____ More than three

Social Activities. (Check the box that applies to you.)

(1) ____ Married

(2) ____ Engaged

(3) ____ Going Steady

(4) ____ Date more than once a week

(5) ____ Date once a week

(6) ____ Date between once a week and once a month

(7) ____ Date less than once a month

(8) ____ Don't date

VITA

James Lee Harris

Candidate for the Degree of

Master of Science

Thesis: AN ANALYSIS OF OKLAHOMA CITY HIGH SCHOOL TECHNICAL GRADUATES AS RELATED TO SUBSEQUENT HIGHER EDUCATIONAL PATTERNS

Major Field: Technical Education

Biographical:

Personal Data: Born in Guthrie, Oklahoma, January 30, 1939, the son of Mr. and Mrs. Labron Eli Harris.

Education: Attended and graduated from high school at Stillwater High School, Stillwater, Oklahoma, in 1957; received a Bachelor of Science degree from Oklahoma State University in 1961 with a major in Mathematics; completed requirements for the Master of Science degree in Technical Education in July, 1968.

Professional Organizations: Data Processing Management Association, Oklahoma Education Association, National Education Association, Oklahoma Technical Society, Oklahoma City Classroom Teachers Association, and Oklahoma Vocational Association.

Professional Experience: Mathematics instructor at Donart High School, Stillwater, Oklahoma, in the 1964-1965 school year; Data Processing instructor at the Oklahoma City Area Vocational Technical Center, Oklahoma City, Oklahoma, in the 1966-1967 and 1967-1968 school years.