A FOLLOWUP STUDY OF OKLAHOMA VOCATIONAL AND NONVOCATIONAL STUDENTS NINE YEARS AFTER GRADUATION

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This writer is grateful to the 1967 high school graduates who contributed personal information for this research. This study is about them, and it is dedicated to the students of the future who might benefit in some way from this research.

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CHAPTER I

INTRODUCTION

The responsibility of educators does not end when the student graduates. The importance of occupational followup was succinctly expressed in a quotation from the report of the Advisory Council on Vocational Education (1968).

> Effective occupational preparation is impossible if the school feels that its obligation ends when the student graduates. The school, therefore, must work with employers to build a bridge between school and work. Placing the student on a job and following up his successes and failure provides the best possible information to the school on its strengths and weaknesses (Little, p. 38).

This responsibility for followup was recognized by the staff of the Oklahoma State Department of Vocational and Technical Education who provided the means for this study.

Statement of the Problem

The generally accepted purpose of vocational education is to prepare individuals for occupational success. One measure of the extent to which this goal is achieved is the salary differential between vocational and nonvocational graduates. Although much research has been done showing the value of vocational education at the point of entry into employment, previous research has not fully investigated the contention that the salary advantage of vocational graduates does not extend past this initial period of employment.

The problem of this research is to assess the long-term economic influence of vocational education on its graduates. The results of this assessment have significant implications related to the value and purpose of vocational education in the education system.

Purpose of the Research

The purpose of this study was to compare the annual earnings of vocational and nonvocational students nine years after graduation from high school. Subjects were sampled from 1967 high school graduates across the state of Oklahoma.

Specifically this study sought to answer three questions:

1. What was the median annual income for vocational and nonvocational graduates by education type, sex, and level of education?
2. Was the vocational education graduate likely to have a significant economic advantage over the nonvocational education graduate?
3. How were other variables related to salary, including sex, level of education, grade point average, type of higher education institution, and perceived satisfaction with high school education?

CHAPTER II

REVIEW OF THE LITERATURE

Numerous followup studies related to the post high school employment experiences of vocational graduates have been conducted. Regretably, most of these were short-term, small-scale studies, directed toward the evaluation of specific occupational programs. This review of the literature focuses on research comparing vocational and nonvocational graduates and long-term followup studies of vocational education graduates.

Information about earnings from previous followup studies was difficult to interpret. Differences in labor markets, wage levels among vocational programs, levels of education, student aptitudes, geographic location, and changes in the value of the dollar made comparisons between studies impractical. The representative citations which follow were selected because of their interpretability and applicability to this study.

Other Reviews of Followup Studies

An extensive analysis of individual followup studies in vocational education was performed by Little (1970). His study reviewed followup information in three categories: (1) administrative reports describing the occupational status of graduates from specific programs; (2) comparative studies contrasting data from different programs or schools; and (3) cost benefit statistics comparing program costs to earnings of

graduates.

Little concluded:

> Despite the inadequacies and deficiencies of the followup studies, certain findings seem to constitute a refrain. . . . Although the findings are contradictory, the preponderance of evidence is that vocational education programs are probably worth their cost. But this conclusion does not blanket in all vocational programs, in all places, or in all fields (p. 36).

A similar review of followup studies in vocational education was undertaken by Krishan (1976). Following a format similar to Little's, he organized his review to include four categories of followup studies: (1) administrative reports, (2) comparative studies, (3) cost-benefit analyses, and (4) studies related to the methodology of the followup process. The comparative and cost-benefit studies are of particular interest to this review of the literature.

Krishan generalized that most comparative and cost-benefit studies showed a greater economic return for vocational education than for academic education. However, the studies he reviewed showed that the benefits of vocational education varied considerably among the types of occupations the programs trained for. Krishan also cautioned that most of these studies suffered from severe limitations which greatly weakened their usefulness as decision-making tools in vocational education.

Sparks (1977) published an excellent review and synthesis of vocational education followup studies completed in the 1970's. His review was of particular interest because it discussed the assertion that vocational education should yield greater benefits than academic or general education because it costs more.

After reviewing a number of national, state, and institutional studies, Sparks (1977) concluded:

> Vocational graduates are doing as well as, and often better than, graduates of other curricula. Most studies show vocationals to be slightly outearning other students shortly after graduation. Especially when vocationals acquire training related jobs. They are often more satisfied with their jobs than academic and general graduates and, for those vocational students who choose to continue their education, the openings are available. Vocational job hunters generally require less time to secure their first jobs and regard their training as important in the acquisition of those jobs. Additionally, the great majority of vocational graduates rate their prior vocational education highly (p. 35).

Sparks also uncovered data which suggest that vocational education was serving a student population that might not be adequately served by academic or general education. He found that vocational education students were generally from lower socio-economic backgrounds, but the followup studies he examined seldom considered this when comparing vocational education with nonvocational education.

The reviews of followup studies by Little, Krishan, and Sparks were helpful in synthesizing the masses of followup data available in vocational education. However, all three of these reviews were limited by a lack of data related to the long-term earning potential of vocational education graduates.

The Eleven Year Followup of Project TALENT

The most comprehensive long-term followup study of high school graduates was Project TALENT conducted for the U.S. Office of Education by the American Institute for Research in Palo Alto, California. In 1960-63, Project TALENT surveyed more than 400,000 students in all of the secondary schools in the United States. These students have been followed up in a longitudinal fashion at intervals of one year, five years, and eleven years after graduation. The principal investigator for the report, J. C. Flanagan (1962, 1964, 1966, 1971, 1973, and

1977), has published an extensive series of technical reports describing the various aspects of this massive study.

Project TALENT did not seek to compare the salaries of vocational and nonvocational graduates. However, it did investigate 109 other variables, some of which were related to post high school employment success. While a detailed analysis of these findings was beyond the scope of the literature review, several highlights of Project TALENT had a bearing on this study.

First, the results of Project TALENT showed that many students were dissatisfied with the occupational and educational preparation provided in high school. Slightly less than half of the respondents believed that they did not receive adequate preparation in high school for subsequent school or jobs. However, only a small portion (6 percent) indicated, in retrospect, that they should have taken a vocational program rather than an academic program, and about the same proportion said they would have done the opposite. Apparently, nearly half of the respondents were dissatisfied with their high school preparation for reasons not related to vocational or nonvocational education. Only a small percentage of respondents (2.5 percent of the men) reported their high school vocational training was very helpful in preparing them for the occupation in which they were employed (Wilson et al., 1975).

Notwithstanding the emergence of the women's movement, men still had much higher rates of employment and higher salaries than did women. In 1971, 40 percent of the men had worked all eleven years since graduation from high school, while only 9 percent of the women had. More than 9 out of 10 men held a full-time job at the time of the followup compared with less than 4 out of 10 women. Omitting half of the unemployed women

who said they had no job because they were housewives raises the proportion of working women to 7 out of 10, which was still 20 percent less than the employment rate for men (Wilson et al., 1957).

Not only did men experience less unemployment, they also earned higher salaries. Employed men reported a median annual income of $11,000 compared with $5,000 for working women. Part of this difference was due to men working more hours per week than women. However, even when the hourly rate was considered, men were earning a median wage of approximately $5.00 per hour compared with $3.00 for women (Wilson et al., 1957).

Project TALENT was not primarily directed at questions related to vocational education. However, some of the findings helped to provide valuable insights into the questions which this study addresses.

Comparative Studies

The following studies compared the earnings or employment of vocational graduates to nonvocational, academic, or general graduates from various populations of workers.

Perhaps the most comprehensive national comparative study was sponsored by the National Education Testing Service. A Comparative Analysis of Postsecondary Occupational and Educational Outcomes for the High School Class of 1972 (Creech, 1977) was an eighteen month followup of 18,000 randomly selected high school graduates from across the nation. The validity of the data was protected by efforts to eliminate the nonrespondent bias which plagued most of the other studies reviewed. The final response rate was a remarkable 90 percent.

Creech's study indicated that vocational high school graduates were employed at a median salary which exceeded their academic classmates by

about 30 percent. The data also showed that blacks were earning about the same as whites, but that males were earning considerably more than females. It must be emphasized that Creech's study was made over the relatively short term of only eighteen months, and his conclusions were not applicable to evaluation of the long-term economic worth of vocational education.

Eninger (1968) surveyed 5,327 graduates representing a national sample of 100 secondary schools. This frequently cited study compared vocational and nonvocational graduates over an eleven-year interval from 1953 to 1964. He reported that vocational graduates started with about the same weekly earnings as nonvocational graduates. However, after eleven years the vocational graduates who remained employed in areas related to their training had higher earnings than noncollege academic graduates. Furthermore, vocational graduates who remained in areas related to their training expressed greater job satisfaction than comparable academic graduates or other vocational graduates in unrelated occupations.

In a less extensive study, Kaufman and Lewis (1968) compared the earnings of vocational and nonvocational graduates from representative cities in Pennsylvania six years after graduation. Regression analysis, used to isolate the effects of education type upon employment and earnings, showed that vocational-technical graduates earned more and were employed for longer periods than academic graduates during the six years following graduation. This differential held after accounting for sex and race interaction.

A followup study in Connecticut (1967) reported that vocational graduates earned substantially more than the average wage earner in the

state. The followup, performed five and ten years after graduation included 682 graduates of 1953 and 1958 from all 14 of the state's regional vocational-technical schools.

A number of followup studies reviewed did not show that vocational graduates have greater earnings than nonvocational graduates. Reubens (1974), in an article for Manpower magazine, found little evidence that high school vocational training resulted in higher wages. She based this assertion on various studies which showed that initial wage advantages leveled out in six to ten years after graduation. Some of the studies on which Reubens based her conclusions were not cited in the article.

In a study conducted by Paulter (1967) 300 former students from high schools in Erie County, New York, were surveyed. Three groups from the 1964 senior class were compared twenty months after leaving school. The three groups were: (1) vocational graduates, (2) nonvocational graduates who did not go on to higher education, and (3) vocational students who should have graduated in 1969 but did not. No significant differences in salaries were found among the three groups.

Bournazos (1963) compared 47 vocationally trained high school graduates with 40 nonvocationally trained graduates over a six-year period from 1957 to 1962 in Lansing, Michigan. He found that there was no statistical difference between the salaries of vocational and nonvocational graduates six years after high school graduation. However, he reported that the vocational graduates had greater job stability and were employed more months during the period studied.

Haines (1965) suggested that the increased earnings reported in followup studies of vocational graduates may be more a result of sex

differences than type of high school education. He compared the weekly earnings of males and females two years and ten months after completing cooperative training programs in office, distributive, and trade and industrial education in Michigan. The data showed that 1963 earnings in occupations which employed mostly males exceeded earnings in occupations which employed mostly females.

Sommers' (1971) national study of 1966 vocational education graduates from high school, post high school, and junior college programs investigated the most significant variables correlated to earnings. Regression analysis showed that level of education beyond high school and sex of the graduates were the most important explanatory variables related to earning during the three-year period following graduation. Sommers' analysis led him to conclude: "At the high school level especially, the particular program area was of little significance in the student's post graduate employment and earnings" (p. 208).

Comparative Studies in Oklahoma

Oklahoma has a recent history of evaluating the success of vocational education through followup studies of program graduates. Two studies relevant to this research compared the employment status of vocational graduates with others in the labor market.

McCloud (1973) surveyed the 1970 graduates of Tulsa high schools two years after graduation. Some of his noteworthy findings were:

1. 24 percent of vocational graduates were in further education compared with 59 percent of nonvocational graduates.
2. 6.1 percent of the vocational graduates in the labor market were unemployed compared with 8.7 percent of the nonvocational

graduates.

3. The median full-time salary was $423.08 per month for vocational graduates compared with $394.51 for nonvocational graduates.

This data showed that vocational graduates had somewhat higher employment and earnings levels than nonvocational graduates. However, this follow-up was made only two years after graduation from high school and did not answer questions related to the long-term value of vocational education in Oklahoma.

Schack (1976) compiled and published followup data which compared unemployment rates of vocational graduates in Oklahoma with unemployment rates for the corresponding age bracket from the total population of all workers in Oklahoma. The results clearly showed that vocational graduates had a significantly higher employment rate than the general population of young workers in the Oklahoma labor market, an advantage which held for the first, third, and fifth year followup of graduates from 1968 through 1974. Unfortunately, data were not available relating to salaries of these graduates compared with the corresponding age bracket from the total labor force.

Noneconomic Benefits of Vocational Education

Although the most frequently cited benefits of vocational education are directly related to employment and earning power, Petrich (1972) and others have identified what they call "life skills" which may be related to vocational education. Petrich's study was based on a survey of perceived needs of vocational and technical students.

Occasionally, researchers have tried to measure some of the possible noneconomic benefits of vocational education. The evidence of these

benefits was usually persuasive, but often intangible and sketchy. One such study, Ghazalah (1974, p. 30), identified several noneconomic benefits as ". . . the greater satisfaction and higher sense of personal worth vocational graduates derive from working in an occupation of their choosing and their increased participation in society brought about by greater self confidence. . . ." These indirect benefits may be more important than the possible economic benefits of vocational education, but they have received little attention in the research probably because they are difficult if not impossible to identify and quantify.

Project Baseline attempted to measure some noneconomic benefits. In his report of this national followup study, Lee (1976) presented evidence which suggested that vocational education improved communications skills, self-confidence, work attitudes, and interpersonal relationships.

Noneconomic benefits listed in the previous citations are open to conjecture. They were included here to emphasize the belief by educators that salary is not the only success indicator of an educational program. In the Epilogue of his book, Life Skills in School and Society, Rubin (1969, p. 154) stated, "Taken as a whole, the message of the writer is that there must be more to education than the mere acquisition of skills which allow one to be gainfully employed."

Summary of the Review of the Literature

The objective of this chapter was to review and synthesize the literature related to the assessment of the long-term value of vocational education compared with nonvocational education.

Compiling the review of literature was difficult because it

required the analysis of an amorphous mass of research. Fortunately, several excellent reviews of followup studies have been published (Little, 1970; Krishan, 1976; and Sparks, 1977). These reviews encompassed a variety of followup studies related to vocational education. The consensus of these authors was that vocational education tended to provide a measurable economic return to its graduates. However, all three reviews lacked sufficient data to support conclusions regarding the long-term value of vocational education.

Project TALENT (Flanagan, 1962, 1964, 1966, 1971, 1973, and 1977; and Wilson et al., 1975) provided the most comprehensive long-term followup data of high school graduates. Some of their findings helped to provide valuable insights into the long-term economic value of vocational education, although Project TALENT was not specifically directed at any of the questions pertinent to this study.

A number of studies were reviewed which compared earnings or employment of vocational graduates with nonvocational, academic, or general graduates. Some of these studies showed that vocational graduates were earning more (Creech, 1977; Eninger, 1968; Kaufman and Lewis, 1968; and Connecticut, 1967), while other studies showed that vocational graduates were not earning more (Reubens, 1974; Paulter, 1967; Bournazos, 1963; Haines, 1965; and Sommers, 1971).

Two comparative studies from Oklahoma were cited. The first of these indicated that vocational graduates were earning slightly more than nonvocational graduates two years after graduation (McCloud, 1973). The second study showed that vocational graduates had less unemployment for up to five years after graduation (Schack, 1976).

Several references were included relating to the noneconomic benefits of vocational education (Petrich, 1972; Ghazalah, 1974; Lee, 1976; and Rubin, 1969). These citations were included to give documentation to the assertion that the indirect benefits of vocational education may be more important than the economic benefits.

In conclusion, the literature reviewed for this report did not provide a basis for useful generalizations regarding the long-term economic value of vocational education as compared with nonvocational education. Most of the research related to this question applied only to specific programs or specific geographic locations. Replication of research findings were scant and contradictory.

CHAPTER III

METHODOLOGY

In order to collect and analyze the data related to the research questions, it was necessary to perform the following steps:

(1) Determine the population.

(2) Develop the followup instrument.

(3) Collect the data.

(4) Analyze the data.

This chapter will describe these steps in detail followed by an explanation of the assumptions used in the study. First, it is necessary to define some special terms as they are used within the context of this research.

Definitions

Vocational education graduate: a student who responded to a 1967 survey of Oklahoma high school seniors that he or she would graduate that year with six or more credits in a single vocational subject not including home economics. Four years of high school equals 32 credits.

Nonvocational education graduate: a student who responded to a 1967 survey of Oklahoma high school seniors that he or she would graduate from high school that year with no credits in any vocational subjects or home economics.

Current annual income: estimated gross annual income from salaries, wages, or self-employment for those respondents stating full-time employment in 1976. Income excludes dividends, royalities, or other income which the subject did not work for.

Data Base: information collected in 1967 from the high school seniors in Oklahoma. Pertinent information from that survey included the student's vocational education background, grade point average, sex, and parents' home address.

Determination of the Population and Samples

The population and data base for this study were drawn from information collected in 1967 from 29,798 high school seniors out of a total of 34,580 students who graduated from high schools in Oklahoma that year. Pertinent information from that survey included the graduate's vocational education background, grade point average, sex, and parents' home address. These data were coded and stored on magnetic tape.

From this population, two groups were selected as follows: those students who had not received any vocational credits and those who had at least six or more credits of vocational education. Four years of high school equals 32 credits. Home economics was not included in either group because training for paid employment is not a primary objective of most of these programs. The two resulting samples contained 5,421 vocational students and 4,005 nonvocational students.

A tedious search through current local telephone directories across the state yielded addresses for only 1,368 of the graduates. However, the names of the parents were more readily located, producing 4,731 addresses.

During the summer of 1976 a letter was mailed to each of the parents to request addresses for the graduates who had not been located in telephone directories. Through this effort 1,800 additional addresses of graduates were obtained.

These combined procedures yielded a total of 3,168 current addresses of vocational and nonvocational graduates. See Table I for a complete tabulation of the data base and return rates.

Development of the Followup Instrument

The purpose of the followup survey was to solicit information regarding the graduates' education beyond high school and his or her current employment status. Questions were worded in such a way as to related directly to the research questions.

The instrument was reviewed by several members of the Oklahoma State Department of Vocational and Technical Education. The final revision was largely the work of Dr. William D. Frazier and Dr. William W. Stevenson of the Division of Research, Planning and Evaluation.

Collection of Data

The followup instruments were mailed directly to the updated addresses of the 1967 graduates. In all, information was solicited from 3,168 graduates. The first letters went out in September of 1976. By December 1, 1976, most of the returns were in. The responses were then coded and keypunched for the initial statistical analysis. During 1977, additional late responses were accepted and added to the data record, and the statistical analysis was repeated. By January, 1978, 1,010 interpretable responses had been obtained

representing a response rate of 31.9 percent. For a complete analysis of the data base and return rates see Table I.

Analysis of Data

To analyze the data, the median test was used as explained by Siegel (1956). The stepwise regression maximum R^2 procedure and the analysis of covariance procedures, according to Barr and Goodnight (1972), were calculated using the Statistical Analysis System computer program.

The median test was used to test for significant differences between the salaries of the vocational and nonvocational graduates. The stepwise regression maximum R^2 procedure was used to determine the independent correlations between salary and each of the independent variables under study, i.e., sex, level of education, higher education institution, perceived satisfaction, and education type. The analysis of covariance technique was used to calculate adjusted salary means.

Assumptions

Because of practical constraints, it was necessary to make certain untested assumptions regarding the response patterns and statistical analysis used in this study.

Due to difficulty in locating many of the high school graduates, it was not possible to use random sampling techniques. Males were more easily located than females, probably because many women had changed their last name due to marriage. Of the 808 subjects 588 (72.8 percent) were males. Responses could only be obtained from children of parents in the least mobile segment of the population, which may have

placed an unknown bias on the data. Furthermore, it was suspected that the more successful segment of the population tended to be more likely to respond to the questionnaire, placing additional bias on the results. However, it was assumed that these response pattern biases would be essentially equal for both vocational and nonvocational graduates. Considering this assumption, it was unlikely that the validity of this research was significantly weakened by biased response patterns.

These assumptions do not suggest that the salary statistics and other data obtained through this study were representative of the entire population of 1967 high school graduates in Oklahoma. Rather, the data were collected from a subpopulation of vocational and nonvocational graduates defined earlier in this chapter. Therefore, it may reasonably be considered that these data were descriptive of only those two groups.

Use of the parametric statistical methods in the analysis of data required certain fundamental assumptions regarding the nature of the sample and population. These assumptions were discussed in Kerlinger and Pedhazur (1973). It was reasonably assumed that any deviation of data from the ideal statistical model was not significant.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Return Rates

The first mailing went to parents to request the addresses of the 1967 graduates who had not been found in telephone directories. Out of 4,731 instruments mailed, 1,800 (38.0 percent) usable responses were returned. The second mailing, containing the salary and education questionnaire (see Appendix), went directly to graduates, including both those whose addresses were found directly from the telephone directories and those whose addresses were obtained from their parents. In all, 3,168 graduates were surveyed for information regarding current salary, level of education, and other employment/education related data. Interpretable responses were obtained from 1,010 (31.9 percent). Of this group, only those 808 respondents (25.5 percent of the graduates surveyed) who were working full time and reported their salary and level of education were included as subjects in the statistical analysis. Table I presents a complete analysis of the data base and return rates.

Distribution of Respondents

This section of the Presentation and Analysis of Data contains tabulation of the education type and sex of the subjects (Table II).

TABLE I

DATA BASE AND RETURN RATE ANALYSIS

Population and Group Breakdown	Return Rate
A. 34,580 total 1967 high school graduates in Oklahoma	
B. 29,798 graduates responding to 1967 survey	86.2% of total graduates (from line A)
C. 5,421 vocational graduates	18.2% of graduates who responded to the 1967 survey (from line B)
D. 4,005 nonvocational graduates	13.4% of graduates who responded to 1967 survey (from line B)
E. 9,426 total vocational and nonvocational graduates	31.6% of graduates who responded to 1967 survey (from line B)
F. 4,731 addresses of parents from telephone directories	50.2% of total vocational and nonvocational graduates (from line E)
G. 1,800 addresses of graduates obtained from questionnaire mailed to parents	38.0% return rate for questionnaire mailed to parents (from line F) and 19.1% of total vocational and nonvocational graduates (from line E)
H. 1,368 addresses of graduates directly from telephone directories	14.5% of total vocational and nonvocational graduates (from line E)
I. 3,168 graduates to whom salary and education instruments were mailed	33.6% of total vocational and nonvocational graduates (from line E)
J. 1,848 vocational graduates to whom salary and education instruments were sent.	34.1% of total vocational graduates (from line C)
K. 1,320 nonvocational graduates to whom salary and education instruments were sent	33.0% of total nonvocational graduates (from line D)

TABLE I (Continued)

Population and Group Breakdown		Return Rate
L.	1,010 total interpretable responses to salary and education instrument	31.9% return rate for salary and education instruments (from line I)
M.	808 respondents working full time and reporting their salary and level of education	25.5% of total instruments mailed out (from line I)

TABLE II

EDUCATION TYPE AND SEX OF SUBJECTS

Education Type	Sex	Frequency	Percent
Nonvocational	Male	268	33.2
	Female	99	12.2
Vocational	Male	320	39.6
	Female	121	15.0
Total		808	100.0

Response Summary

This section contains a frequency compilation by education type for the responses to each question in the salary and education questionnaire (see Appendix). Each question is restated and followed by a tabulation

of the responses (Tables III-VI). Tables III and IV present a summary of the responses to question 1:

What additional education have you had beyond high school?
(a) Number of years and highest degree?
(b) Type of school (college, area school, etc.)

TABLE III

LEVEL OF EDUCATION BEYOND HIGH SCHOOL

Level of Education Beyond High School	Vocational		Nonvocational	
	N	Percent	N	Percent
None	75	17.0	13	3.6
Less than two years	67	15.2	24	6.5
Two or more years, but less than a bachelor degree	107	24.3	64	17.4
Bachelor degree, but less than a graduate or professional degree	157	35.6	173	47.1
Graduate or professional degree	35	7.9	93	25.4
Total	441	100.0	367	100.0

Table V contains a summary of the responses to question 2:

How do you feel high school served you in preparing for your occupation or for additional education required in your occupation?

____Very Well ____Good ____Only Fair ____Very Poorly

TABLE IV

TYPE OF HIGHER EDUCATION INSTITUTION

Type of Institution	Vocational		Nonvocational	
	N	Percent	N	Percent
None	75	17.0	13	3.5
College of University	319	72.3	343	93.5
Vo-Tech (not college credit)	43	9.8	9	2.5
Other Post Secondary Education	4	0.9	2	0.5
Total	441	100.0	367	100.0

TABLE V

PERCEIVED SATISFACTION WITH HIGH SCHOOL PREPARATION FOR OCCUPATION OR ADDITIONAL EDUCATION

Satisfaction Level	Vocational		Nonvocational	
	N	Percent	N	Percent
Very Well	127	28.8	112	30.5
Good	191	43.3	160	43.6
Only Fair	95	21.5	74	20.2
Very Poorly	26	5.9	20	5.4
Unusable Responses	2	0.5	1	0.3
Total	441	100.0	367	100.0

Question 3 was stated as follows:

> What is your present occupation? If you have more than one job what is your major occupation? (Please don't tell us who you work for, but rather, what your job is. Examples: carpenter, homemaker, salesman, or doctor - not construction, Sears, hospital, etc.)

The responses to this question were too varied and ambiguous to tabulate or interpret within the format of this study. Many of the responses were esoteric job titles that could not be classified such as "production manager" or "design liaison consultant."

Question 4 was stated as follows:

> What one high school subject or course helped you most in your present work?

Most of the responses to this question were also too ambiguous and unspecific to be classified in any meaningful way. Many of the responses took the form of comments of a general nature relating to the respondent's view of the high school curriculum as a whole.

Table VI contains a summary of the responses to question 5:

> If you are presently self-employed or employed by someone else for pay, please answer the following:
> (a) Employed: ____Full-Time ____Part-Time
> ____Average number of hours per week
> (b) What do you estimate your present income from salaries, wages, or self-employment would be for a year? (Please don't include dividends, royalities, or other income for which you don't work - but do include fringe benefits, withholding, and not just 'take home' pay in your estimate.)

Statistical Analysis

This section contains the results of the statistical analysis related to each research question.

TABLE VI

ANNUAL INCOME NINE YEARS AFTER GRADUATION,
FULL-TIME EMPLOYMENT

Annual Income Increments	Vocational		Nonvocational	
	N	Percent	N	Percent
$ 3,000 or less	2	0.5	2	0.5
3,001-4,500	4	0.9	2	0.5
4,501-6,000	15	3.4	13	3.5
6,001-7,500	27	6.1	19	5.2
7,501-9,000	60	13.6	30	8.2
9,001-10,500	80	18.1	56	15.3
10,501-12,000	58	13.2	61	16.6
12,001-13,500	41	9.3	33	9.0
13,501-15,000	51	11.6	35	9.5
15,001-16,500	24	5.4	34	9.3
16,501-18,000	28	6.3	21	5.7
18,001-19,500	17	3.9	18	4.9
19,501-21,000	12	2.7	14	3.8
21,001-22,500	8	1.8	8	2.2
22,501-24,000	2	0.5	5	1.4
24,001-25,500	2	0.5	6	1.6
25,501-27,000	3	0.7	2	0.5
27,001-30,000	2	0.5	4	1.1
30,001-50,000	3	0.7	3	0.8
over 50,000	2	0.5	1	0.3
Total	441	100.0	367	100.0

Research Question One

Table VII contains the results relating to research question one:

What was the median annual income for the vocational and nonvocational graduates by education type, sex, and level of education?

TABLE VII

FULL-TIME MEDIAN SALARIES FOR VOCATIONAL AND NONVOCATIONAL 1967 HIGH SCHOOL GRADUATES FROM OKLAHOMA

Years of Education Beyond High School	Male Graduates		Female Graduates	
	Vocational	Non-vocational	Vocational	Non-vocational
None	$12,000 N = 46	$15,750 N = 10	$ 8,187 N = 29	$ 6,760 N = 3
Less than two years	10,227 N = 46	12,250 N = 18	8,813 N = 21	9,000 N = 6
Two or more years, but less than a bachelor degree	12,750 N = 79	11,885 N = 46	9,167 N = 28	9,750 N = 18
Bachelor degree, but less than a graduate or professional degree	13,579 N = 120	13,615 N = 124	9,288 N = 37	9,542 N = 49
Graduate or professional degree	14,813 N = 29	15,300 N = 70	12,000 N = 6	11,125 N = 23
Overall Median	$12,882 N = 320	$13,700 N = 268	$ 8,978 N = 121	$ 9,825 N = 99

Research Question Two

> Was the vocational education graduate likely to have a significant economic advantage over the nonvocational education graduate?

When the median test was applied to the data presented in Table VII, no difference was found (at the .10 significance level) between the salaries of vocational and nonvocational graduates matched by education level and sex.

The data were further tested for possible significance using the chi square method to test the independence of salary from education type. This nonparametric statistical test also determined that there was no significant difference between the salaries of vocational and nonvocational graduates matched by education level and sex.

Research Question Three

> How were other variables related to salary, including sex, level of education, grade point average, type of higher education institution, and perceived satisfaction with high school education?

Table VIII contains the results of the stepwise regression maximum R^2 procedure. Sex, grade point average, level of education, and higher education institution were found to be significant determinants of salary, while perceived satisfaction and education type appear to have no relationship to salary.

All of these variables accounted for only 19.2 percent of the salary variance, with sex explaining 15.2 percent. Grade point average and level of education accounted for only 2.6 percent and 1.0 percent respectively. Type of higher education institution accounted for only 0.4 percent. The combined effect of the other two variables, perceived

satisfaction and education type, accounted for less than 0.6 percent of the salary variance.

TABLE VIII

RESULTS OF MAXIMUM R^2 REGRESSION ANALYSIS FOR SALARY

Source of Variance	Sum of Squares	R	R^2
Sex	1334	.388	.152***
Grade Point Average	231	.161	.026**
Level of Education	91	.101	.010**
Higher Education Institution	36	.064	.004*
Perceived Satisfaction	7	.029	.000
Education Type (Vocational or Nonvocational)	5	.023	.000
Sum of Squares Regression	1704		
Sum of Squares Error	7179		
Sum of Squares Total	8883		
Percent of Explained Variance (from Total R^2)			19.2%
Percent of Unexplained Variance			80.8%

***Significant at the .001 level
**Significant at the .01 level
*Significant at the .05 level

The mean salaries for vocational and nonvocational education graduates were adjusted, using the analysis of covariance technique, to remove any effects resulting from the concomitant variables: sex,

level of education, grade point average, etc. The adjusted salary means were not significantly different (Table IX) at the 0.10 level of significance. This result further substantiated the previous findings of no significant difference in salary between vocational and nonvocational graduates.

TABLE IX

ADJUSTED MEAN SALARIES OF VOCATIONAL AND NONVOCATIONAL GRADUATES

Education Type	N	Adjusted Mean Salary
Nonvocational Education	367	$12,106
Vocational Education	441	$11,864

Mean salaries are adjusted for: sex, level of higher education, grade point average, higher education institution, and perceived satisfaction.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study, as stated in Chapter I, was to compare the annual earnings of vocational and nonvocational students nine years after graduation from high school. Subjects were from the 1967 high school graduates across the state of Oklahoma. Specifically this study sought to answer three questions:

1. What was the median annual income for the vocational and nonvocational graduates by education type, sex, and level of education?
2. Was the vocational education graduate likely to have a significant economic advantage over the nonvocational education graduate?
3. How were other variables related to salary, including sex, level of education, grade point average, type of higher education institution, and perceived satisfaction with high school education?

To answer these questions, it was necessary to conduct a mail followup from the population of 1967 high school graduates. The data base for this followup was drawn from information collected from most of the 34,580 students who graduated from high school in Oklahoma in 1967.

Two systematic samples were selected from this population as follows: those students who had not received any vocational credits

(N = 4,005) and those who had at least six or more credits of vocational education (N = 5,421).

Current addresses for the subjects were obtained by searching through local telephone directories and mailing letters to parents of the graduates. A total of 3,168 current addresses of the vocational and nonvocational graduates was obtained

A followup instrument was designed to solicit information regarding the graduates' education beyond high school and his or her current employment status. This instrument was mailed directly to the updated addresses of the 1967 graduates. From this mailing, 1,010 interpretable responses were obtained. Only those respondents working full time and reporting their salary and level of education were included as subjects in the statistical analysis, leaving 808 subjects or 25 percent of the initial 3,168 graduates surveyed.

The data were then compiled and analyzed statistically to answer the research questions. Median annual income for vocational and nonvocational graduates was computed and compiled by education type, sex, and level of education. The results were tabulated in Table VII, Chapter IV. When the median test was applied to these data no significant differences were found between the salaries of the vocational and nonvocational graduates when matched by education level and sex. However, men were earning significantly more than women at all levels of education.

The stepwise regression maximum R^2 procedure was used to determine if other variables were related to salary, including sex, level of education, grade point average, type of higher education institution, and perceived satisfaction with high school. Sex, grade point average, level of education, and higher education institution were discovered

to be the only significant determinants of salary, with sex accounting for 15.2 percent of the 19.2 percent explained variance. See Table VIII, Chapter IV, for a complete compilation of the regression analysis.

The mean salaries for vocational and nonvocational graduates were adjusted to remove effects from the other explanatory variables. The adjusted salary means were approximately $12,000 per year for both vocational and nonvocational graduates, further substantiating the findings of no significant difference in salary between vocational and nonvocational graduates.

In summary, no evidence was found to show that vocational education provided either an economic advantage or disadvantage nine years after graduation.

Conclusions

1. There was no significant difference in the full-time median annual income for vocational and nonvocational graduates when matched by education level and sex. Therefore, there was no evidence to support the existence of an economic advantage for either the vocational or the nonvocational graduates nine years after graduation.
2. The full-time median salary of males was significantly higher than the median for females. This disparity held regardless of education type or level of higher education.
3. Grade point average and level of higher education were significantly related to earnings. In general, higher grades and more years of higher education meant greater income. This relationship held regardless of sex or education type. The only

exception to this conclusion was that male graduates with no higher education were earning more than those who had some education beyond high school. Male vocational graduates without higher education had approximately the same income as those with two years of higher education, and male nonvocational graduates without higher education were earning approximately the same as those with graduate or professional degrees. No evidence was found which might explain this exception.

4. Sex, grade point average, level of education, and higher education institution were the only variables included which were shown to be related to salary. Of these variables, sex was, by far, the most important. However, more than 80 percent of the salary variance remained unexplained by any of the identified variables.

Findings Related to Review of Literature

The literature reviewed in Chapter II did not strongly corroborate or contradict the findings of this study. Several sources were cited which, as in this study, were unable to show increased earnings for vocational education graduates (Reubens, 1974; Paulter, 1967; Bournazos, 1963; Haines, 1965; and Sommers, 1971).

The findings by Sommers were nearly the same as the results of this study. His regression analysis found that level of education and sex were the most significant variables related to earnings, and he also found that the type of high school education was not significant.

Haines presented findings which suggested that followup studies of vocational graduates may reflect increased earnings that are more a

result of sex differences than type of high school education. His conclusion was strongly supported by the results of this study which showed sex was the most important salary determinant.

There were several other studies cited in the Review of the Literature which showed greater earnings for vocational graduates (Creech, 1977; Eninger, 1968; Kaufman and Lewis, 1968; Connecticut, 1967; and McCloud, 1973). The conclusions of this study tended to contradict the findings of these authors. However, these contradictions may be reconciled by considering that most of the research reviewed applied only to specific programs, specific time frames, or restricted geographic locations, and it was impossible to generalize those findings to apply to 1967 vocational and nonvocational graduates in Oklahoma.

Recommendations

1. There was no evidence to show an economic advantage for vocational education graduates nine years after graduation from high school. It is recommended that vocational as well as academic educators attempt to identify and teach a broad range of skills and knowledge which will be of value to the graduate through a lifetime of education and work.
2. The full-time median salary was significantly greater for males than for females. It is recommended that further research be conducted to determine if, or how, education can help female workers earn more money.
3. Level of higher education was directly related to earnings regardless of sex or education type. It is recommended that vocational educators prepare their students for further

education by counseling them regarding the potential economic advantage of higher education.

4. Sex, grade point average, level of education, and higher education institution were the only identified variables related to salary. However, more than 80 percent of the variance remained unexplained by any of the variables identified. It is recommended that further research be conducted to isolate additional variables which are significant salary determinants.
5. This study did not compare the entry level abilities and aptitudes of vocational and nonvocational students. It is recommended that further research be conducted to determine the relationship between student characteristics and the benefits derived from vocational education.
6. "It is generally agreed that important decisions related to vocational education, affecting billions of dollars, and millions of people are being made without adequate information about the impact of effectiveness of vocational education" (Krishan, p. 29). It is recommended that further followup evaluations of vocational education be performed on a larger scale, with more students and on a regional and national level.
7. This study found no evidence of long-term economic benefits of vocational education. It is recommended that further research be conducted to identify and measure other possible educational outcomes such as psychological and sociological benefits of vocational education.

Implications

The findings of this study imply that the earning power of high school graduates was probably related more to individual abilities and post-high school experiences than to type of high school education. There were certainly countless intervening variables which influenced the lives of these subjects during the nine years following graduation from high school. Marriage, children, military service, and job changes are examples of a few. The influence of these unmeasured variables over the nine-year period was perhaps the reason for the high level of unexplained variance in salary. These results strongly suggest that any relationship between high school education and salary became diluted beyond the level of significance by the effects of time and experience since graduation from high school in 1967.

SELECTED BIBLIOGRAPHY

Advisory Council on Vocational Education. The Bridge Between Man and His Work. Madison, Wisconsin: Center for Studies in Vocational and Technical Education, University of Wisconsin, 1968.

Barr, A. J. and J. H. Goodnight. A User's Guide to the Statistical Analysis System. Raleigh, North Carolina: North Carolina State University, 1972.

Bournazos, Kinon. Vocational Education: Its Effects on Career Patterns of High School Graduates. East Lansing, Michigan: Bureau of Educational Research Services, College of Education, Michigan State University, 1960.

Connecticut State Department of Education. A Summary of Five and Ten Year Graduate Followups. Hartford, Connecticut: Division of Vocational Education, 1967.

Creech, Reid. Comparative Analysis of Postsecondary Occupational and Educational Outcomes. Princeton, New Jersey: Educational Testing Service, 1977.

Eninger, Max U. The Process and Product of Trade and Industry High School Level Vocational Education in the United States. Pittsburg, Pennsylvania: Educational Systems Research Institute, 1968.

Flanagan, J. C., et al. Design for a Study of American Youth. Palo Alto, California: American Institutes for Research, 1962.

Flanagan, J. C., et al. The American High School Student. Palo Alto, California: American Institutes for Research, 1964.

Flanagan, J. C., et al. Project TALENT One-Year Followup Studies. Palo Alto, California: American Institutes for Research, 1966.

Flanagan, J. C., et al. Five Years After High School. Palo Alto, California: American Institutes for Research, 1971.

Flanagan, J. C., D. V. Tiedman, and M. B. Willis. The Career Data Book. Palo Alto, California: American Institutes for Research, 1973.

Flanagan, J. C. "Planning Career Goals Based on Data from Project TALENT." The Vocational Guidance Quarterly (March, 1977), pp. 270-273.

Ghazalah, I. A. "The Economic Value of Vocational Education: Report of a Study in Eighteen Schools." American Vocational Journal (January, 1974), pp. 98-103.

Haines, Peter G. How High School Cooperative Trainees Fare in the Labor Market: Phase B. East Lansing, Michigan: Bureau of Educational Research Services, College of Education, Michigan State University, 1965.

Kaufman, Jacob J. and Morgan V. Lewis. The Potential of Vocational Education: Observations and Conclusions. University Park, Pennsylvania: Institute for Research on Human Resources, Pennsylvania State University, 1968.

Kerlinger, F. N. and E. J. Pedhazur. Multiple Regression in Behavioral Research. New York: Holt, Rinehart and Winston, 1973.

Krishan, Paul K. A Manual for Conducting Followup Surveys of Former Vocational Students. Columbus, Ohio: Ohio State University, Center for Vocational and Technical Education, 1975.

Lee, Arthur M. Learning a Living Across the Nation. Volume V., Prepared for the National Advisory Council on Vocational Education. Flagstaff, Arizona: Northern Arizona University, 1976.

Little, J. Kenneth. Review and Synthesis of Research on the Placement and Followup of Vocational Education Students. Columbus, Ohio: Center for Vocational and Technical Education, Ohio State University, 1970.

McCloud, Paul. The Class of 1970: Phase II of a Followup Study of the Graduates of the Tulsa Public Schools. Tulsa, Oklahoma: Tulsa Public Schools, 1973.

Paulter, A. J. "A Followup Study of Vocational High School Graduates in Erie County, New York With Implications for Vocational Education." (Unpub. dissertation, State University of New York at Buffalo, 1967.)

Petrich, Beatrice. Assessment of Felt Needs for Preparation in "Life Skills" of Graduates of Diploma and Associate Degree Programs in the Wisconsin Vocational, Technical, and Adult Education System. Madison, Wisconsin: Department of Home Economics, University of Wisconsin, 1972.

Reubens, B. G. "Vocational Education: Performance and Potential." Manpower (July, 1974), p. 26.

Rubin, L. J. Life Skills in Schools and Society. Washington, D.C.: Association for Supervision and Curriculum Development, National Education Association, 1969.

Schack, Markham B. "A Comparison of the Unemployment Rates of Vocational Education Graduates in Oklahoma to the Unemployment Rates of the General Population of Young Workers in Oklahoma." Did You Know. Stillwater, Oklahoma: Oklahoma State Department of Vocational and Technical Education, April, 1976.

Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956.

Somers, Gerald G. The Effectiveness of Vocational and Technical Programs: A National Followup Study. Madison, Wisconsin: Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971.

Sparks, Doug. A Synthesis of Research Findings Which Describe Selected Benefits and Outcomes for Participants in Vocational Education. Washington, D.C.: Bureau of Occupational and Adult Education, Department of Health, Education, and Welfare, 1977.

Wilson, et al. The American Citizen: Eleven Years After High School. Palo Alto, California: American Institutes for Research, 1975.

APPENDIX

THE FOLLOWUP INSTRUMENT

Vo-tech OKLAHOMA STATE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FRANCIS TUTTLE, DIRECTOR • 1515 WEST SIXTH AVE., • STILLWATER, OKLAHOMA 74074 • A.C. (405) 377-2000

August 1, 1976

Dear

This is not a letter of solicitation or recruitment of students! The Oklahoma State Department of Vocational and Technical Education is constantly attempting to improve its services to the citizens of Oklahoma. To do this, we conduct a periodic survey of former high school students to find out who well they were served by the educational system. We use this information to improve programs for current and future students.

Our records show that you are a close relative of (JOHN DOE) who was a high school senior in 1967. You can help the State Department to contact him/her by completing the information below and returning it in the self-addressed envelope enclosed for your convenience. It is vital that we obtain a current address regardless of his/her current employment or educational status. We are seeking only information about how education served the students and the address will not be used for any other purpose. We need your help in this effort.

Former student's name: (JOHN DOE)

Present mailing address: _____

_____
City State Zip

Thank you very much for your response.

Sincerely,

Bill Stevenson, Ed.D.
Assistant State Director

Enclosure

WS/XDD-01/14

(This instrument has been reduced from legal-size letterhead)

VoTech
OKLAHOMA STATE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FRANCIS TUTTLE, DIRECTOR • 1515 WEST SIXTH AVE., • STILLWATER, OKLAHOMA 74074 • A.C. (405) 377-2000

September 1, 1976

This is not a letter of solicitation or recruitment of students! In February, 1967, you and over 29,000 other high school seniors in Oklahoma responded to a questionnaire regarding your course work and future plans. During the past few months, we have been obtaining current addresses from telephone directories and/or responses from parents so that we might correspond directly with you.

The purpose of this survey is to find out how high school education served students in 1967, and how we might improve our educational services to future high school students. For this study, we are asking all the former students we could locate to respond to the questions below and return the letter to the State Department in the enclosed self-addressed envelope. As you might expect, many of the former students could not be located, so your response is of vital importance to us. We can assure you that your response will be kept confidential and that we will not use the data you give us to compare schools or individuals.

1. What additional education have you had beyond high school?

   a. Number of years and highest degree? _____

   b. Type of School? (College, area school, etc.) _____

2. How do you feel high school served you in preparing for your occupation or for additional education required in your occupation?

   _____Very well _____Good _____Only fair _____Very poorly

3. What is your present occupation? If you have more than one job, what is your major occupation? (Please don't tell us who you work for, but rather, what your job is. Examples: carpenter, homemaker, salesman, or doctor not construction, Sears, hospital, etc.)

   _____

4. What one high school subject or course helped you most in your present work?

   _____

5. If you are presently self-employed or employed by someone else for pay, please answer the following:

   a. Employed: ____Full time ____Part time ____Average # hours each week

   b. What do you estimate your present income from salary, wages, or self-employment would be for a year? (Please don't include dividends, royalties, or other income for which you don't work but do include fringe benefits, withholding, and not just "take home" pay in your estimate).

____ $3,000 or less	____ 9,001-10,500	____ 16,501-18,000	____ 24,001-25,500
____ 3,001 4,500	____ 10,501 12,000	____ 18,001-19,500	____ 25,501-27,000
____ 4,501-6,000	____ 12,001-13,500	____ 19,501-21,000	____ 27,001-30,000
____ 6,001-7,500	____ 13,501 15,000	____ 21,001-22,500	____ 30,001-50,000
____ 7,501-9,000	____ 15,001 16,500	____ 22,501-24,000	____ Over 50,000

We realize the question on income is "none of our business," however, we do hope to get a relationship between education and income. Let us reassure you that all replies will be kept confidential that your response will not be associated with your name. We do thank you very much for your help. We sincerely believe it will help us improve high school education.

Sincerely,

Wm. D. Frazier

Wm. D. Frazier, Ed.D.
Coordinator of Research

VITA 2

Markham B. Schack

Candidate for the Degree of

Doctor of Education

Thesis: A FOLLOWUP STUDY OF OKLAHOMA VOCATIONAL AND NONVOCATIONAL STUDENTS NINE YEARS AFTER GRADUATION

Major Field: Higher Education

Biographical:

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