

1975

An analysis of the impact of federal funds authorized by the 1963 Vocational Education Act, as amended, on program development in the area schools of Iowa

Harvey Dale Martin
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Iowa State University, Ph.D., 1975
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An analysis of the impact of federal funds authorized by
the 1963 Vocational Education Act, as amended, on
program development in the area schools of Iowa

by

Harvey Dale Martin

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
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INTRODUCTION

Federal legislation in terms of the Vocational Education Act of 1963 and subsequent federal legislation in terms of the Vocational Education Amendments of 1968 has been significant legislation in providing supplemental funds for subsidizing vocational education programs operated by state and local schools.

The vocational education acts and amendments were most significant for a segment of higher education in Iowa. This segment, the vocational schools and community colleges, was established by an Act of the Iowa Legislature in 1965. The Vocational Education Act of 1963 with its provisions for increasing previously authorized appropriations and providing for the inclusion of institutions of higher education on the eligible list to receive supplemental funds for the support of vocational-technical education, plus the more recent Vocational Education Amendments of 1968, could be having a major impact on program development in vocational schools and community colleges of Iowa.

Statement of the Problem

This investigation was designed to analyze the effects of federal funds, allotted to the state of Iowa under the Vocational Education Act of 1963, as amended, on the development of full-time preparatory vocational-technical education programs operated by the fifteen area schools of Iowa in terms of the goals set in the Vocational Education Act of 1963 as amended by the Vocational Education Amendments of 1968, and the Iowa

State Plan.

The assumption in the study was that federal funding provided by the Acts has had a major impact on career education in the area schools of Iowa during the fiscal years of 1968 through 1973. It was hypothesized that federal funds for the area schools were responsible for producing more programs, greater enrollment, and more completions in the vocational-technical programs of the area schools. It was also assumed that the Office of Education, the Department of Public Instruction of the State of Iowa, and the area schools of Iowa were cooperating to the ultimate degree as stated in the Vocational Education Amendments of 1968 (88, p. 1).

It is the purpose of this title to authorize Federal grants to States to assist them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis, so that persons of all ages in all communities of the State-- those in high school, those who have completed or discontinued their formal education and are preparing to enter the labor market but need to upgrade their skills or learn new ones, those with special educational handicaps, and those in postsecondary schools--will have ready access to vocational training or re-training which is of high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interests, and ability to benefit from such training.

The Iowa State Plan (56, p. 2) further proclaims the federal monies provided under Part B of Public Law 90-576 be used in the State of Iowa to:

. . . initiate, implement, and evaluate career education programs, services, and activities conducted by State and local personnel to serve these population groups:

- 1) Youths in secondary schools
- 2) Youths who have completed or left high school and are available for study in preparation for entering the labor market
- 3) Youths and adults who have already entered the labor market and who need training to achieve stability or advancement in employment
- 4) Disadvantaged youths and adults
- 5) Handicapped youths and adults

These assumptions, based on the declared purposes of the vocational acts and on the objectives of the Iowa State Plan, suggested the following questions about certain possible relationships in analyzing the effects of federal funding on the development of full-time vocational-technical programs in the area schools of Iowa:

- 1) Is there evidence of a common relationship existing between the number of full-time vocational-technical programs offered by the area schools and the fiscal years in which the programs were offered?
- 2) Is there evidence of a common relationship existing between the number of full-time vocational-technical programs offered by the area schools of Iowa and the assessed valuation of the area schools?
- 3) Is there evidence of a common relationship existing between the number of federal dollars received by the area schools of Iowa and the number of full-time vocational-technical programs offered by the area schools?
- 4) Is there evidence of a common relationship existing between the number of federal dollars received by the area schools of Iowa

and the full-time-equivalent enrollment of vocational-technical students?

- 5) Is there evidence of a common relationship existing between the number of federal dollars received by the area schools of Iowa and the assessed valuation of the area schools?
- 6) Is there evidence of a common relationship existing between the number of federal dollars received by the area schools of Iowa and the assessed valuation per full-time-equivalent enrollment of vocational-technical students?
- 7) Is there evidence of a common relationship existing between the number of students completing the full-time vocational-technical programs in the area schools of Iowa and the number of programs being offered by the area schools?
- 8) Is there evidence of a common relationship existing between the number of federal dollars received by the area schools of Iowa and the number of students completing the full-time vocational-technical programs of the area schools?
- 9) Is there evidence of a common relationship existing between the number of counselors employed by the area schools of Iowa and the number of federal dollars received by the area schools?
- 10) Is there evidence of a common relationship existing between the number of counselors employed by the area schools of Iowa and the number of full-time-equivalent enrollment of students in the full-time vocational-technical programs of the area schools?
- 11) Is there evidence of a common relationship existing between the

number of vocational-technical students completing the full-time programs in the area schools of Iowa and the number of counselors employed by the area schools?

The answers to these eleven questions are important to the state of Iowa and to each area school if the design is to evaluate efforts to provide programs for vocational-technical students which meet the goals and objectives of the Vocational Education Act of 1963, the Vocational Education Amendments of 1968, and the Iowa State Plan.

Purpose of the Study

The purpose of the study was to determine, define, and analyze the effects of federal funds authorized by the Vocational Education Act of 1963, as amended by the Vocational Education Amendments of 1968, on the development of full-time preparatory vocational-technical programs in the fifteen area schools of Iowa.

During the period since the enactment of Chapter 280A, 1966 Iowa Code (38), and since the area schools became fully operable under the Code, no direct evaluation of the results or effects of the Vocational Education Act of 1963, as amended by the Vocational Education Amendments of 1968, has been made. This study was needed to evaluate the impact of funds authorized by the Acts in order to facilitate future federal legislation and future state planning for financing of vocational-technical education.

Definition of Terms

The following definitions of key terms, as used in this study, are presented below:

- 1) Act(s): refers specifically to the Vocational Education Act of 1963 as amended by the Vocational Education Amendments of 1968.
- 2) Area School: means a publicly supported vocational school or community college authorized by the 1966 Iowa Code, Section 280A, to offer as its program, or part of its program, vocational-technical education at a level of what is generally considered grade thirteen and fourteen, but may also include high school level programs.
- 3) Counselor: a person so identified by the area school where employed and reported to the Department of Public Instruction annually on the Iowa Professional School Employees Data Sheet.
- 4) Full-time Preparatory Program: means a program in vocational-technical education of at least twelve weeks in length at an area school operating on the quarter system or eighteen weeks in length at area schools operating on the semester plan. The full-time preparatory program is listed in the area school's vocational division and is approved by the State Board as a full-time preparatory program.
- 5) Merged Area: means one of the fifteen areas of the State of Iowa supporting an area school.
- 6) Program: The term "program" is used in this study to define

any approved sequence of courses, experiences, or activities which, upon completion by a student, leads to a degree, certificate, or diploma granted by the area school.

- 7) State Board: means the Iowa State Board of Public Instruction of nine members.
- 8) State Plan: refers to the publication(s) submitted by the State Board of Public Instruction pursuant to the vocational education acts and amendments. The state plan is updated and submitted periodically to the Office of Education, Department of Health, Education and Welfare.
- 9) Vocational-Technical Education: For the purpose of this study, vocational-technical education means the programs offered by the area schools of Iowa to provide for vocational or technical education, training, or retraining, designed to enable student graduates to enter or reenter the labor market.
- 10) Vocational-Technical Training: means the same as vocational-technical education for this study.
- 11) State Department: means the Department of Public Instruction including the state superintendent of public instruction and his staff responsible for carrying out the State Board policy.

Sources of Data

Data for this study were collected from working papers, annual reports, and computer printouts of the Iowa Department of Public Instruction. Data obtained pertaining to full-time preparatory vocational-technical

programs funded either fully or partially under the selected sections of the Acts, as amended, were collected and tabulated in the same format as the tables used to present the data in the findings section of this study.

Delimitations

The scope of this study was limited to an examination of the full-time preparatory vocational-technical programs offered by the area schools of Iowa. Only continuing programs that were approved after July 1, 1966 for an area school or new programs started in fiscal 1968 through fiscal 1973 were considered. Programs that were not fully or partially funded with monies authorized by the Vocational Education Acts of 1963 as amended by the Vocational Education Amendments of 1968 were not selected for consideration in this study.

A further limitation consisted of only considering programs funded by grants authorized under Section 122a of the Vocational Education Amendments of 1968.

The study was concerned only with funds granted to the State of Iowa under section 122a of the Vocational Education Amendments of 1968, which were used to support full-time preparatory vocational-technical programs in the fifteen area schools of Iowa.

The scope was further limited to an examination of programs for agriculture occupations, distributive education, health occupations, office education, technical occupations, and trade and industrial occupations.

Organization of the Study

The material presented in this study was divided into six sections. The first section provides an introduction or setting for the study, a statement of the problem, the purpose of the study, definition of key terms as used in the study, sources of data, delimitations, and the organization of the study. The second section contains a summary of related literature. Methods and procedures for the study are found in section three. Section four contains the findings. Section five is a discussion and the sixth is a summary.

REVIEW OF LITERATURE

Major antecedents to the present structure of vocational education in the United States must be identified in order for a proper analysis to be made of the impact of federal funding on program development in the state of Iowa. Vocational education is not new nor is legislation pertaining to vocational education new. Early legislation, though not providing funds for educational support, has influenced the form of vocational education to this day.

History of Vocational Education Legislation

During the middle fifteen hundreds an apprenticeship program operated on a national basis in England, and in 1601 a series of "poor laws" was passed which allowed children of the poor to be placed with families who could provide them with experiences that would equip them for the "world of work" or provide the children of poor families with salable skills. Immigrants from England aware of the success of the apprenticeship programs in Europe started two forms of this type of vocational education in the colonies. One form was voluntary and the apprentice who wished to learn a specific trade selected a person who could teach him the trade and the two entered into an agreement. The other form was compulsory and established by legislation. The Massachusetts General Court in 1642 (78, p. 59) adopted a law requiring poor families to place their children with the well-to-do to see that the children obtained an education that included the development of salable skills.

Butts (23, p. 251) in referring to the colonies as the state of New England, made the following remark:

The state of New England, was establishing its rights to require vocational education through compulsory apprenticeship at the same time as it required education in language and reading.

This type of legislation denied poor children access to the "professions" but did establish the groundwork for vocational education becoming preparatory for obtaining a salable skill. Although, in general, the poor are not denied access to the professions; the prevailing philosophy of those early Americans still exists. There are the "trades" and there are the "professions." Legislative actions since colonial times depict this philosophy.

The Old Deluder Satan Act of 1647 required compulsory education. Towns were required to establish schools and there were arguments over separation of church and state, secularism, public schools and nationalism. The colonies gained their independence and a national constitution was framed. People began moving westward. Agriculture was dominant in the West, industry in the East. Skilled labor was needed in both areas. The people in the industrial system were trained and needed less practical education than those in the agrarian system. Congress passed the Land Ordinances of 1785 and 1787 to provide education for those moving westward. The Northwest Ordinance was the first legislation specifically mentioning education (79, p. 15).

This practice of land grants for the support of public education was continued under land grant legislation in the Ohio Enabling Act of 1802

and the more extensive support when four sections of land were given to the states of Utah and Arizona for the support of education when they obtained statehood (79, p. 17).

The Military Academy at West Point and the Naval Academy at Annapolis, established in 1802 and 1845 respectively, might be considered examples of initial vocational education, although each of these institutions was provided for a specific purpose and some argument could be waged toward not considering them as offering true vocational programs.

Early in the nineteenth century however, both the farmers and the industrialists started demanding a "practical" education. The United States population was increasing rapidly and many young men were interested in training for the "world of work."

Congress responded with a major piece of legislation, the Morrill Act of 1857, which was vetoed by President Buchanan as being unconstitutional. Congress revised the 1857 Act and the Morrill Act of 1862 was passed and signed by President Lincoln. This act was the first of a series of acts passed by the Congress because of specific demands for vocational training in identifiable basic need areas. Its purpose was "to promote the liberal and practical education of the industrial classes in the several pursuits and professions of living" (99, p. 44). Grants of land were provided to endow, support, and maintain state colleges devoted to the agricultural and mechanical arts.

Grant Venn (99, p. 45) says the Morrill Act of 1862 resulted in a major redirection of American education and had long range effects on vocational and technical education in the United States. According to

its provisions, grants of land were set aside to be used for the funding and upkeep of state colleges specializing in the teaching of agricultural and mechanical arts. This resulted in the development of sixty-eight colleges and universities which have provided leadership in education and research. In addition to this, he lists five effects of the Morrill Act on the development of vocational and technical education.

- (1) A liberal and practical education was prescribed. The two were not to be placed in separate camps. The classical studies were integrated into curricula that were plainly vocational, and both were to be accommodated without any sense of inferiority.
- (2) As the financial and philosophical basis of the state university systems, they opened the doors of higher education to a far wider public, removing forever the idea of a single education for a select few.
- (3) The act gave important status to the mechanic arts and agriculture, and, with the useful-practical controversy as part of its background, greatly changed the college-level teaching of these courses and of the other sciences. Science was to be taught, not just for its own sake, but as an instrument for molding the societal environment.
- (4) The new form of education broke through the suspicions and fears of education of farmers and businessmen. The resistance to agricultural and mechanical education in the colleges, noted earlier, gradually was overcome by the extension programs, experimental farms, and the success of graduates over the first two decades of the operation of the new colleges. This acceptance of vocationalism in the colleges was to have much significance in the later movement to extend vocationalism into the public schools.
- (5) The role of the agricultural colleges in improving agriculture in this country was so dramatic and so widely recognized that this new form of education came to be accepted as vital to the national welfare, as a spur to economic growth.

Other federal legislation which was intended to encourage agricultural research as an aid to farmers included the Hatch Act of 1887 and the

Smith-Lever Act of 1914.

The Davis Bill of 1907 and the Page Bill of 1912 were two unsuccessful efforts toward federal funding of vocational education. These bills proposed a federal system of vocational schools, but both were defeated.

While Charles Davis of Minnesota and Carroll Page of Vermont were working to gain support of their bills in Congress, a group of vocationally oriented men were forming a National Society for the Promotion of Industrial Education (35, pp. 71-72). The year 1906 saw the National Society membership representative of government, industry, labor, education, and other major facets of society as well as the public at large studying the needs of vocational education. The Society immediately went to work organizing state committees to work with the National Society and by October of 1907 the Society had among the committees' membership from thirty-five states 203 vocationally oriented persons declaring their willingness to support and become a vital part of the National Society.

During the eight years from 1906 to 1914 the diverse group of members of the Society conducted studies of all phases of vocational education throughout the country. Reports of these studies were printed and widely distributed. Through the efforts of the membership of the National Society for the Promotion of Industrial Education, Congress became aware of the great need for vocational education throughout the United States and took the following action (90, p. 20).

The Commission on National Aid to Vocational Education was created by act of Congress approved January 20, 1914, authorizing the President of the United States to appoint a commission of nine members "to consider the subject of national aid for vocational education and report their findings and recommendations not later than June 1 next."

President Wilson immediately appointed a representative committee, the Commission on National Aid to Vocational Education, and this commission made its report to Congress on June 1, 1914. The Commission recommended federal grants to provide vocational education as a part of the total educational system, and recommended the appointment of an independent federal board to work with existing state boards in administering the program.

The result of the report of the Commission on National Aid to Vocational Education was the passage of the Vocational Education Act of 1917, better known as the Smith-Hughes Act (90, p. 21). The provisions of this act included the creation of a Federal Board of Vocational Education and the requirement that each state wishing to qualify for federal funds designate a state board having power to cooperate with the Federal Board for Vocational Education. Each state was also required to submit a state plan showing how the proposed funds would be used. By the end of 1917 all forty-eight states had submitted state plans for approval by the Federal Board. Since each state had developed plans according to its own needs, it would seem that there would have been considerable variation in state plans, but the provisions of the Smith-Hughes Act were quite specific and because of federal guidelines the various states' vocational programs were similar.

The Smith-Hughes Act appropriated funds for vocational education at the secondary school level. Funds could be used for salaries of instructors, supervisors, and directors of industrial subjects, home economics, trade classes, and agricultural courses and also for teacher training.

States or the local communities were required to provide matching funds and to bear all supplemental costs of instruction.

The states' efforts to qualify for federal funds pointed up a number of concerns which continue to be significant questions. Some of these were: states' rights, the role of the federal government, industry's responsibility in providing training for specific skills, and the unification of educational efforts through an extension system.

The Smith-Hughes Act provides an annual appropriation of seven million dollars to the states which is only a fraction of the federal appropriations for vocational education today. However its grants were assured to the states "in perpetuity" and its major provisions were unchanged by amendments until 1963. Even though the basic Act has been amended by Congress and changed by executive order with Congressional consent, none of these changes affected the major purposes of the Act or changed the comparative relationships required between the states and the federal government.

The Smith-Hughes Act is one of the few bills passed by Congress in which the authorization and the appropriation were together in the original law so that there is no need for an annual appeal to Congress for funds.

In the years that followed passage of the Smith-Hughes Act, Congress passed other supplemental legislation relating to vocational education.

The George-Reed Act (99, p. 60) was a temporary measure approved by Congress in 1929. It authorized one million dollars annually from fiscal 1930 through 1934 to expand vocational education in agriculture and in home economics.

The George-Ellzey Act, sometimes called the Vocational Education Act of 1934 (99, p. 60) replaced the George-Reed Act and authorized an appropriation of three million dollars including support for trades and industrial training. Funds were to be equally divided among the categories of agricultural education, home economics, and trade and industrial education. Funds were to be made available to each state from 1935 through 1937 according to the approved state plan.

In 1936, the George-Deen Act (99, p. 60) authorized, on continuing basis, twelve million dollars annually and affixed no expiration date for these increased authorizations. Again, as before, the increase was to be divided among the categories of agricultural education, home economics, and trade and industrial education. Also, one million dollars per year were provided for teacher training in the indicated areas. Another first in the areas of vocational education was the authorization of one million two hundred thousand dollars for the distributive education occupations. This was the first federal support for this area of vocational education.

During World War II a program for Vocational Education for National Defense was set up by the Congress to provide war production workers with preemployment and supplementary training (99, p. 61). This program was so successful that it provided considerable impetus for support of the George-Barden Act of 1946.

The George-Barden Act (99, p. 61) was passed as an amendment to the George-Deen Act of 1936. For the first time since the Smith-Hughes Act of 1917, a marked increase in federal funding was evident. Congress

added a total of twenty-nine million dollars to the fourteen million dollars authorized in the George-Deen Act. The George-Barden Act authorized funds for the same four areas for which funds had been previously authorized. The total funding consisted of ten million dollars for vocational education in agricultural subjects, eight million dollars for vocational education in home economics, eight million dollars for vocational education in trades and industry, two and one-half million dollars for vocational education in distributive education, and five hundred thousand dollars for administration. These funds were approved for programs of administration, supervision, and teacher training; for salaries and travel expenses of teachers, teacher-training, and vocational counseling personnel; for program development, for training and work-experience programs for out-of-school youths; for purchase or rent of equipment and supplies for instruction; provided that all expenditures for these purposes were made in accordance with the state plan for vocational education. All federal funds under this Act were to be matched by an equal amount of local or state funds.

Funds provided under the vocational acts of 1929, 1934, 1936, and 1946 all have restrictions like those in the Smith-Hughes Act of 1917, yet promising exceptions can be found in Section seven of the George-Barden Act of 1946 (83, pp. 8-9).

Section 7. The appropriations made under authority of this act shall be in addition to, and shall be subject to the same conditions and limitations as the appropriations made to carry out the Smith-Hughes Vocational Education Act; except that

- (1) the appropriations made under authority of this Act for home economics shall be subject to the conditions and

limitations applicable to the appropriation for agricultural purposes under the Smith-Hughes Vocational Education Act, with the exception of that part of section 10 thereof which requires directed or supervised practice for at least six months per year;

- (2) such moneys as are provided under authority of this Act for trade and industrial subjects, and public and other service occupations, may be expended for part-time classes operated for less than one hundred forty-four hours per year;
- (3) the provisions of section 11 of the Smith-Hughes Vocational Education Act, requiring at least one-third of the sum appropriated to any State to be held to include any part-time day-school classes for workers sixteen years of age and over, and evening school classes for workers sixteen years of age and over;
- (4) the appropriations made by this Act for distributive occupational subjects shall be limited to part-time and evening schools as provided in the Smith-Hughes Vocational Education Act, for trade, home economics, and industrial subjects and is qualified by the provisions of this section;
- (5) pre-employment schools and classes organized for persons over eighteen years of age or who have left the full-time school may be operated for less than nine months per year and less than thirty hours per week and without the requirement that a minimum of 50 per centum of the time must be given to shop work on a useful or productive basis; and
- (6) the appropriations available under section 9 of this Act shall be available for expenses of attendance at meetings of educational associations and other organizations and for expenses of conferees called to meet in the District of Columbia or elsewhere, which, in the opinion of the Commissioner, are necessary for the efficient discharge of the provisions of this Act.

In June, 1944 Congress passed and President Franklin D. Roosevelt signed one of the nation's most significant educational acts, and vocational education was an important recipient of its benefits. This was the Serviceman's Readjustment Act or the GI Bill (78, p. 76). It is estimated that of the approximately one million people educated under the GI Bill,

30 percent received college training, 30 percent got on-the-job training from private industry and agriculture, and the remaining 40 percent received education at institutions of less than college level. Besides the 30 percent participating directly in vocational education, it should be noted that many veterans who were enrolled in colleges received vocational teacher education and subsequently taught vocational subjects. Veterans of the Korean and Viet Nam conflicts as well have had GI Bill benefits extended to them in a similar fashion.

Thompson says (78, p. 77) the Serviceman's Readjustment Act and the amendments thereto deserve special comment due to their sound philosophy and their impact on vocational education. They contain few stipulations. He commends the flexibility of the Acts and the fact that there are relatively few recorded abuses by either individuals or by institutions.

The Health Amendments Act of 1956 (83, p. 2) added Title II, Vocational Education in Practical Nurse Training, as an amendment to the George-Barden Act of 1946. It authorized an annual appropriation for grants to states of five million dollars for the period of 1957 to 1961 for the purpose of improving practical nurse training.

The Fishing Industries Act of 1956 (82, p. 1) appropriated five hundred fifty thousand dollars yearly to promote fishing industries through grants to provide education and training for professional personnel needed in commercial fishing.

In 1957 the Soviet Union's launching of the world's first small space satellite generated a national uneasiness in the United States regarding the adequacy of our science and technology. This led to the quick passage

of the National Defense Education Act of 1958 (84). The necessity for training highly skilled technicians for military and scientific capability gave impetus for increasing federal assistance for vocational education.

Title III of the National Defense Education Act amended the George-Barden Act of 1946 by adding Title III, Area Vocational Education Programs, to that Act. This authorized fifteen million dollars annually for area vocational educational programs for a period of four years.

Funds appropriated under this act were to be used to train highly skilled technicians in recognized occupations requiring scientific knowledge in fields necessary to national defense and for administration, supervision and teacher training programs. Research for the development of programs, the cost of equipment, supplies and teaching aids were also admissible expenditures.

In 1961 amendments to Title VIII of the National Defense Education Act (28, p. 28) extended funding for two more years.

The National Defense Education Act provided a large number of technicians the opportunity to retrain and to update skills as well as graduating a sizable number of highly skilled technicians. As a result of the Act and the studies it prompted, most of the states took appropriate action and passed necessary legislation to improve their vocational and technical programs. Another important outcome was a new interest in the further improvement of technical education and an increased awareness of its importance in our developing technological society.

Congress passed the Area Redevelopment Act in 1961 (80) authorizing

4.5 million dollars annually for four years for retraining people who were unemployed or underemployed and living in geographic areas designated as areas needing redevelopment. In 1962 the Manpower Development and Training Act legislation (97, pp. 173-174) authorized 97 million dollars for the first year and 161 million dollars annually for the next three years for training purposes. Both the Area Redevelopment Act and the Manpower Development and Training Act provided subsistence payments to trainees. These bills were designed to help educate and train broad segments of the population not covered by previous legislation. The person seemed to take precedence over the program in these bills--a first in federal funding of vocational education legislation. Vocational education has been shaped by the historical development of the United States, the needs of its society, and the desires of its people. While each act inventoried so far suggests something of the atmosphere for vocational education in the United States from colonial times to the very early sixties, the sixties actually saw the beginning of significant changes in vocational education. United States technology was on the increase and the need for vocationally trained people to keep up with development in technology was evident. Skills needed could not be successfully learned by experience on-the-job training, therefore, formal education was recognized as a necessary ingredient for developing skills needed in the new technology.

Vocational Education Act of 1963

When President Kennedy took office in 1961, he very much realized the status of vocational education in the United States. He directed the Secretary of Health, Education, and Welfare to appoint a panel of consultants for vocational education and in his message to Congress, President Kennedy made the following remarks (78, p. 37):

The National Vocational Education Acts first enacted by Congress in 1917 and subsequently amended have provided a program of training for industry, agriculture, and other occupational areas. The basic purpose of our vocational education effort is sound and sufficiently broad to provide a basis for meeting future needs. However, the technological changes which have occurred in all occupations call for a review and re-evaluation of these acts, with a view towards their modernization.

To that end, I am requesting the Secretary of Health, Education and Welfare to convene an advisory body drawn from the educational profession, labor, industry, and agriculture as well as the lay public together with representatives from the Departments of Agriculture and Labor to be charged with the responsibility of reviewing and evaluating the current National Vocational Education Acts, and making recommendations for improving and redirecting the program.

This advisory body, later to be known as the Panel of Consultants on Vocational Education, consisted of twenty-five consultants representing the areas suggested by President Kennedy. The Panel headed by Dr. Benjamin Willis, Chicago Public School Superintendent, prepared a report, "Education for a Changing World of Work." The report was widely distributed throughout the United States and was supported by vocational educators, national and state legislators, and those people who had a need for manpower to produce their products and services.

The Panel examined a number of programs, looked at educational

achievements, studied the existing limitations, and thoroughly evaluated vocational education historically and philosophically. The Panel recommended that (90, p. 222):

Vocational education must be made available to all people who have the need, the desire, and the ability to benefit from such instruction.

The Panel then recommended financial aid to specific groups and services (90, pp. 224-25):

- (1) Youth in high school who are preparing to enter the labor market or to become homemakers.
- (2) Youth with special needs.
- (3) Youth and adults who have completed or left high school and are spending full time in preparing to enter the labor market.
- (4) Youth and adults who are unemployed or at work, who need training or retraining to achieve employment stability.
- (5) Services required to assure quality in all vocational and technical education programs.

The Panel of Consultants (90, pp. 206-14) had two major concerns when it reported in 1962: 1) vocational educators' lack of awareness to changes in the needs of the labor market, and 2) its lack of awareness of the needs of the various segments of the population of the United States. In addition to the general recommendation made above, many specific recommendations for change in vocational education were made (90, pp. 224-264). All general recommendations and most of the specific recommendations were included in the Vocational Education Act of 1963.

A U.S. Senate Committee on Labor and Public Welfare (36, p. 37), said that:

In 1963 Congress gave fundamental and philosophical attention to vocational education for the first time since 1917. The immediate motivation was high unemployment among untrained and inexperienced youth. However, a long run impetus was provided by the growing importance of formal preparation for employment in an increasing technical and sophisticated economy.

The Panel of Consultants had been critical of the federal "legislative patchwork" that had been provided to support vocational education from 1917 to 1962. They were critical of the lack of federal funding for vocational programs. All were not in agreement with the recommendations and doubted some of the Panel's findings. A number of critics of the Report felt that the Panel had completely ignored some basic and very apparent facts concerning the financing of vocational education. One specifically ignored fact was the need for support of the student while engaged in on-the-job training. Two previous legislative actions had provided subsistence allowances for students in training. Another criticism was directed at the Panel because it did not recommend that the employment services have a part in the vocational training programs. Some thought it was necessary to provide better articulation between vocational education and the employment services activities for more viable programming. Sar Levitan (65, p. 23) says that the Panel apparently held to the position of many vocational educators, that of keeping the employment services isolated from educational affairs, or "leave education to the educators." Also, it seemed that the Panel assumed vocational education to be naturally good, since no consideration was given in the report to the quality or the effectiveness of the programs underway.

Because of the report of the Panel, President Kennedy proposed the

Omnibus Education Bill (85) containing a Title pertaining to vocational education. This Title proposed abolishment of the George-Barden Act and substituted a vocational education bill providing for an annual increase of twenty-three million dollars for four years, in addition to the seventy million dollars annually available under the George-Barden Act, the Smith-Hughes Act, and their amendments. The Title also proposed that the employment services would determine whether there were reasonable expectations of employment prior to having a vocational program funded.

Carl Perkins, congressman from Kentucky, introduced into the House of Representatives a proposal which would continue the funding provided by the George-Barden Act and the Smith-Hughes Act and provided for additional funding for vocational education each year. His bill, in contrast to Kennedy's bill, eliminated the requirement of approval of the public employment services for funding.

The Perkins Bill was passed by Congress as the Vocational Education Act of 1963 (87). The allocations were sixty million dollars for 1964, one hundred eighteen million five hundred thousand dollars for 1965, one hundred seventy seven million five hundred thousand dollars for 1967 and succeeding years. The major portion of the funds was to be allocated to the states on a formula based on personal income and the population in certain age groups of the state.

The law states that the state board for vocational education in each state is to be the sole agency for the administration of the funds in the state. A state, wishing to receive allotments is required to

submit a plan for the use of the funds to the United States Commissioner of Education. As a result of this legislation, and the differences in the organization and administration of the different state departments of vocational education, there are now considerable differences in the ways that states administer the funds.

The Vocational Education Act of 1963 provides for a consolidation of some of the previous acts by amendments that combine and extend portions of the Smith-Hughes Act and the George-Barden Act, including the Practical Nurse Training and the Area Vocational Education parts. The 1963 Act also amended and extended the National Defense Education Act of 1958.

The primary aims of the Act are (87, p. 1):

To strengthen and improve the quality of vocational education and to expand the vocational education opportunities in the Nation, to extend for three years the National Defense Education Act of 1958 and Public Laws 815 and 874, Eighty-first Congress (federally affected areas), and for other purposes.

Section 1 (87, p. 1) contains the stated Declaration of Purpose of the legislation:

It is the purpose of this part to authorize Federal grants to states to assist them to maintain, extend, and improve existing programs of vocational education to develop new programs of vocational education, and to provide part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis, so that persons of all ages in all communities of the State--those in high school, those who have completed or discontinued their formal education and are preparing to enter the labor market, those who have already entered the labor market but need to upgrade their skills or learn new ones, and those with special educational handicaps--will have ready access to vocational training or retraining which is of high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment and which is suited to their needs, interests, and ability to benefit from such training.

The Act does not discriminate against anyone or any group of persons over fourteen years of age, and with the exception of those positions generally considered professional or which require a baccalaureate or higher degree, no occupation is excluded. The state is encouraged to spend the funds to best implement its own needs for vocational education. Funds allocated to a state may be used, in accordance with Section 4(a) of the Act (87, p. 3) and the state's approved plan for the following purposes:

- (1) vocational education programs for high school students, including such programs which are designed to prepare them for advanced or highly skilled postsecondary vocational and technical education;
- (2) vocational education for persons who have completed or left high school and who are available for study in preparation for entering the labor market;
- (3) vocational education for persons (other than persons who are receiving training allowances under the Manpower Development and Training Act of 1962 (Public Law 87-415), the Area Redevelopment Act (Public Law 87-794) who have already entered the labor market and who need training or retraining to achieve stability or advancement in employment;
- (4) (A) vocational education for persons (other than handicapped persons defined in section 108(6) who have academic, socioeconomic, or other handicaps that prevent them from succeeding in the regular vocational education program;
(B) vocational education for handicapped persons who because of their handicapping condition cannot succeed in the regular vocational education program without special educational assistance or who require a modified vocational education program;
- (5) construction of area vocational education school facilities;
- (6) vocational guidance and counseling designed to aid persons enumerated in paragraphs (1) through (4) of this subsection in the selection of, and preparation for, employment in all vocational areas;

- (7) provision of vocational training through arrangements with private vocational training institutions where such private institutions can make a significant contribution to attaining the objectives of the State plan, and can provide substantially equivalent training at a lesser cost, or can provide equipment or services not available in public institutions; and
- (8) ancillary services and activities to assure quality in all vocational education programs, such as teacher training and supervision, program evaluation, special demonstration and experimental programs, development of instructional materials, and improved State administration and leadership, including periodic evaluation of State and local vocational education programs and services in light of information regarding current and projected manpower needs job opportunities.

Several new features to federal aid in the area of vocational education become apparent with the passage of the Vocational Education Act of 1963. According to Mobley and Barlow (71, p. 201) one exceptional feature is that of flexibility.

It is apparent that the Vocational Education Act of 1963 places more responsibility than heretofore placed upon the state and local community for the development of programs of vocational education which meet the fundamental purposes of the Act. If only one characteristic is used to describe differences between the vocational-education acts of the past and the Act of 1963, that characteristic should be flexibility.

Congressman Perkins, (81, p. 23106) in recommending the report of the conference committee for passage of the bill, made the following statements regarding the bill:

The conference agreement maintains the important provisions of the original House passed bill with respect to:

- First. Permitting States to transfer funds between categories under the Smith-Hughes and George-Barden Acts.
- Second. Broadening the definition of vocational agriculture to include agriculture related occupations.
- Third. Authorizing assistance to business and office and other occupational training not now covered by Smith-Hughes and George-Barden.

Fourth. Periodic analysis of job market conditions so as to assure that the vocational education program will be actually geared to meet employment opportunities.

Fifth. Emphasis on the construction and operation of area vocational schools and that type of program which assures an opportunity in all areas for persons to attend a full-time course of occupational training in the vocational field of his preference.

The Department of Health, Education, and Welfare (93, pp. 1-8) made the following statements:

The Vocational Education Act of 1963 was passed because of the accumulating evidence that the old Federal program of assistance to vocational education--the one begun by the Smith-Hughes Act in 1917 and augmented and supplemented over the years by other acts of Congress--was not broad enough, or flexible enough, or rich enough, to meet the needs of today, much less the needs of tomorrow,

The Act is comprehensive: it shuts out no group, no occupation, except those generally considered professional or as requiring a baccalaureate or higher degree. It is concerned about workers of all ages at all levels for all fields; about persons in sparsely settled areas as well as the urban; about delinquent young people as well as the most industrious; about the employed as well as the unemployed and the underemployed.

The Act is not only idealistic but realistic; it requires each State and each community to plan its vocational education programs with an eye always on the changes taking place in the economy and the world of work. The Vocational Education Act of 1963 cannot become obsolete: the machinery for keeping it flexible and up to date is built into it.

The new act does not terminate any of the vocational education programs already in existence. But it does affect them. By the amendments it makes in the earlier acts, it meshes the new program with the old programs, so that all become coordinated parts of a whole.

The Vocational Education Act of 1963 did not become operational because of the lag between legislation and appropriations until 1965 and was evaluated in 1967 by the first evaluation team provided for by the evaluation system which was built into the Act. This evaluation system

provided for an Advisory Council on Vocational Education consisting of twelve people to be appointed by the Secretary of Health, Education, and Welfare for the Purpose of (87, p. 9):

reviewing the administration of vocational education programs for which funds are appropriated pursuant to this Act and other vocational education Acts and making recommendations for improvement of such administration, and reviewing the status of and making recommendations with respect to such vocational education programs and the Acts under which funds are so appropriated.

The first Advisory Council was to be appointed in 1966, perform an evaluation as directed above, and report to the Secretary no later than January 1, 1968. From time to time thereafter, the Secretary appoints a new advisory council for the same purpose. Advisory Councils may be appointed oftener, but one must be appointed at least every five years and report its findings not later than July 1 of the second year after its appointment.

Although the Advisory Council encountered a number of problems because of the previously mentioned lag in getting the provisions of the 1963 Act in operation, it did review the Act and its contributions to vocational education for the two years that the legislation was in operation, prior to its first evaluation.

The Advisory Council on Vocational Education completed its first report on December 1, 1967 and presented it to the Secretary of Health, Education, and Welfare. It claimed an extensive review and evaluation of vocational education as provided in the Vocational Education Act of 1963, identifying many accomplishments, but making the following statement (97, p. 195):

While much progress can be claimed, there still remain limitations and impediments which must be overcome to fully meet the intent and purposes of the Act.

To overcome the limitations, the Advisory Council made a number of recommendations to provide for meeting the vocational education needs of the United States and improve the effectiveness of the vocational programs (97, pp. 197-204).

- (1) That all Federal vocational education acts administered by the Office of Education be combined into one act.
- (2) That a Department of Education and Manpower Development be established at Cabinet level.
- (3) That fund and permanent authority be provided for the Commissioner of Education to make grants or contracts to State boards and with approval of the State board to local educational agencies and to other public or non-profit private agencies, organizations, or institutions for planning, development, and operation of exemplary and innovative programs of occupational preparation.
- (4) That funds and permanent authority be provided to develop and operate new expanded vocational educational programs and services specifically designed for persons who have academic, social, economic, or other handicaps.
- (5) That the act provide permanent authority for work-study and include work-study and work experience programs in the secondary schools and those at the post-secondary levels related to vocational and technical education.
- (6) That funds and permanent authority be provided for the Commissioner to make grants to State boards of vocational education and, with the approval of the State board, to colleges and universities, and/or to public educational agencies to construct facilities and operate residential vocational schools.
- (7) That the act provide for at least 25 percent of the funds appropriated for allocation to the States to be used for the intent set forth in purpose (2), post-secondary schools, and (3), adult programs, of the Vocational Education Act of 1963.

- (8) That the act include vocational homemaking education in a separate section of the act with specific funding authorization.
- (9) That the act provide for the distribution of funds to the States on bases which will encourage increased enrollment, attendance, and improved performance.
- (10) That the act permit matching of the Federal allotment on a statewide basis.
- (11) That provision be made for States to receive allotments earlier in the calendar year and expenditure of funds be authorized through the succeeding year.
- (12) That the act provide that salaries and expenses needed for the administration of vocational and technical education be included in the annual appropriation for this act.
- (13) That provisions for developing a State plan in the act provide that a state shall, through its designated State board for vocational education, (a) Submit for approval a properly executed legal contract to the Commissioner of Education on such forms and in such detail as the Commissioner deems necessary to assure compliance with the provisions of the Act and regulations, and (b) Submit a 5-year projected plan for administering and operating programs of vocational and technical education. An annual updating of the plan to reflect changes and modifications contemplated would be submitted on or before the beginning of each fiscal year.
- (14) That the act recognize the need and provide support for professional and paraprofessional staff recruitment, preparation, and upgrading at all levels, including leadership, administration, teacher education, and counseling and guidance on a state, regional, and national basis.
- (15) That 25 percent of the funds appropriated for title IV of the Higher Education Act of 1965 be set aside for opportunity grants for students interested in entering post-secondary technical and vocational programs.
- (16) That funds be authorized for pilot projects to study the feasibility of reimbursement to employers for unusual costs of supervision, training, and instruction of part-time cooperative students in publicly supported education.
- (17) That 10 percent of the sums appropriated for the purposes

listed in section 4(a) of VEA 1963 shall be used by the Commissioner of Education for the following purposes:

- a. For grants or contracts to colleges and universities and other public or non-profit private agencies and institutions to pay part of the cost of research and dissemination of research results in vocational and technical education;
- b. For grants or contracts approved by the operating bureau for evaluation, demonstration, and experimental programs in vocational and technical education and for dissemination of results;
- c. For grants to States for paying part of the cost of State research coordinating units, State research, evaluation, demonstration, and experimental programs in vocational and technical education and dissemination of results.

- (18) That the act provide funds and require the Office of Education to be responsible for collecting data and preparing an annual descriptive and analytical report on vocational education to be submitted to the President and Congress.
- (19) That the act provide that each State conduct a periodic statewide review and evaluation of its vocational education program.
- (20) That the act include within the definition of vocational education "prevocational" education and "employability skills."
- (21) That section 4(a) of the Vocational Education Act of 1963 be changed to delete the word "area" and that section 8.2 be changed to read: "The term vocational education facilities refers to. . . ."
- (22) That the definition of vocational education in the act be expanded to include the responsibility of education for initial job placement and followup for persons who:
 - a. Have completed or are about to complete a program of education;
 - b. Require part-time employment to remain in school;
 - c. Need work experience which is an integral part of an educational program.
- (23) That in order to meet current needs, authorization levels for administering and operating programs of vocational and technical education under the act be established as follows: (The Advisory Council recommended specific amounts for each of the various areas of reference and provided supporting data for its recommendations.)

Thompson (78, p. 43) made the remark that:

Seldom have recommendations made by an advisory group found their way into law as rapidly as those of the 1968 Advisory Council. The 1968 amendments to the 1963 Vocational Education Act are in large measure these recommendations. In fact, they were enacted by Congress prior to their official release by the United States Office of Education.

As can be seen, congressional leaders were sold on the recommendations of the Council and quickly amended the Vocational Education Act of 1963.

Vocational Education Amendments of 1968

Basically, the Vocational Education Amendments of 1968 to the Vocational Education Act of 1963 expanded parts of the 1963 Act and began setting up ways of converting the concepts in the 1963 Act into vocational education programs. The 1968 Amendments (88) provided for national and state advisory councils for vocational education, stressed the importance of development of new programs, emphasized programming for the disadvantaged and handicapped, and focused attention on cooperative and work-study programs. Curriculum development and exemplary programming were each considered important enough to be granted separate parts in the Act. Also, provisions for residential schools were outlined. In a small way these amendments began to break down the traditional lines dividing the vocational programming in a particular area.

Vocational educators on the national, state, and local levels started looking at vocational education in terms of the needs and motivations of the students, rather than in terms of the recognized traditional areas of vocational education. Grote (33, pp. 44-48) during the time of

his presidency of the American Vocational Association, wrote, when the 1968 Amendments were passed:

Unless we in vocational education can demonstrate . . . ability to develop a delivery system and the resources to make it effective in meeting the needs of all people, unless we are flexible enough to adjust to changing job requirements--and unless we wake up to the fact that we can ill afford to alienate ourselves from other phases of education and/or levels of instruction--then we face the possibility of another state and/or federal agency assuming the leadership in manpower training and development.

Vocational legislation of the sixties caused a philosophical shift in the thinking of many individuals, including vocational educators, national and state legislators, federal officials in the Department of Health, Education, and Welfare, Presidents Kennedy, Johnson, and Nixon, and persons in state and local educational agencies. This was very much in evidence in the first review by the Advisory Council for Vocational Education in 1969 (97). Melvin Barlow (13, pp. 1-2) made the statement that:

Vocational education was invented by society for its own good. Millions of people--nearly seven million in 1967 have received benefits from the program. Even so, it does not now serve as many people as it should. Hopefully, the national review will facilitate change so that more and more people are provided the skills and knowledges needed to adjust to changing occupational requirements.

According to Arnold (5, pp. 3-4) action directed toward change was started less than two weeks after President Johnson signed the 1968 Amendments into law on October 16, 1968. The U.S. Office of Education called State Directors of Vocational Education into Washington for orientation purposes. New guidelines and state plans had to be written prior to states receiving any federal grant funds. This meant that few,

if any, additional funds under Amendment regulations would be available in fiscal 1969. Many agencies in each state had to be called upon to aid in the planning that was required in so short a time. The assistance, involvement, and cooperation of these agencies in the planning was a boon to cooperative planning by all state agencies for vocational education.

According to the Vocational and Technical Annual Report of 1968 (96, pp. 111-112), a review of State reports submitted during fiscal 1968 indicated that the states had begun early to establish goals and objectives to meet the needs that were expressed by the 1968 Advisory Council on Vocational Education. The Annual Report indicated that it was quite evident from the State reports that the following unmet needs were receiving consideration:

- (1) Provide remedial education
- (2) Seek out the discouraged and undermotivated and encourage them to take advantage of available educational services
- (3) Provide education to remedy the academic deficiencies of those left behind by rising educational attainment
- (4) Develop prevocational orientation to expose those of limited experience to alternative occupational choices
- (5) Provide training for entry level skills for those unable to take advantage of advanced training because they lack rudimentary education
- (6) Induce employers to accept less able employees for on-the-job training
- (7) Provide work-experience for those unaccustomed to the discipline of the work situation
- (8) Plan, develop, and operate exemplary and innovative programs of occupational orientation and preparation

- (9) Develop and operate new and expanded vocational education programs and services specifically designed for persons who have academic, social, economic, or other handicaps.
- (10) Provide for work-study programs at the secondary and post-secondary levels structured so as to combine education, training, and work-experience, as well as offer income opportunities
- (11) Encourage increased enrollment, attendance and improved performance in vocational education programs
- (12) Support professional and paraprofessional staff recruitment, preparation, and upgrading at all levels, including leadership, administration, teacher education, and counseling and guidance
- (13) Support research, evaluation, demonstration, and experimental programs in vocational and technical education and dissemination of the results
- (14) Include the responsibility of education towards initial job placement and follow-up of persons who: a. have completed or are about to complete a program of education, b. require part-time employment to remain in school, and c. need work experience which is an integral part of an education program

Iowa State Plan for Vocational Education

The state of Iowa has accepted the provisions of Federal Vocational Acts since the beginning. Chapter 257 and 258 of the Iowa Code are the currently designated chapters dealing with the responsibilities of the state in promoting vocational education as legislated by the United States Congress. Chapter 258 of the Code of Iowa (37, p. 975) states:

The provisions of the Act of Congress entitled "An Act to provide for the promotion of vocational education; to provide for cooperation with the states in the promotion of such education in agriculture and in the trades and industries; to provide for cooperation with the states in the preparation of teachers of vocational subjects; and to appropriate money and regulate its expenditure," approved February 23, 1917, (29 Stat. L. 929; 20 U.S.C., ch 2) and all amendments thereto and the benefit of all funds appropriated

under said Act and all other Acts pertaining to vocational education, are accepted.

This chapter provides for the identification of the state board for vocational education, establishes the qualifications for an advisory committee for vocational education, outlines the duties of the two groups and provides for certain planning and reporting concerning vocational education in the state of Iowa. Provision is made for the State Board of Public Instruction to serve as the State Board for Vocational Education, with the superintendent of public instruction as executive officer of the State Board of Public Instruction being responsible, with the help of necessary additional personnel, for carrying out the provisions of the acts and amendments of the United States Congress.

With the development of the Smith-Hughes Act in 1917 (90, p. 22), it was necessary for a state desiring to participate in the benefits of vocational legislation to prepare a State Plan showing the programs it intended to provide under the Vocational Act. Simple unsophisticated State Plans for the state of Iowa were submitted to the Federal offices during the years from 1918 to 1963. These plans were accepted at the Federal level and provided the guidelines for the administration of vocational education in the state of Iowa for forty-five years.

However, with the passage of Public Law 88-210 (87) the Vocational Education Act of 1963, a more sophisticated and detailed State Plan was required from each state participating. The state of Iowa presented its State Plan, with much more detail than previous plans, to the United States Office of Education on December 15, 1964. It was immediately approved

by the federal office and went into effect on December 15, 1964.

This 1964 State Plan anticipated the development of area vocational schools and community colleges by the Iowa Legislature, and included in section four (58, pp. 52-55) provisions for area vocational schools to become local educational agencies under the terms of the vocational acts and amendments.

Section two point one of the State Plan (58, p. 32) designated those persons to be served:

The vocational training or retraining program will be developed to meet the needs, interests, and abilities of all persons who have need for, desire, and who can benefit from the instruction for all categories; secondary, post-secondary, adult, and special.

Section two point two of the State Plan (58, p. 33) designated the occupations to be served:

Occupations for which training will be conducted include the areas of agriculture, business and office occupations, distributive, health occupations, home economics, trade and industrial, technical, and other occupations except those generally considered professional or requiring the baccalaureate degree.

The Sixty-first General Assembly of Iowa did, as anticipated, provide for the development of Area Vocational Schools and Community Colleges (38, pp. 1041-1047). With two minor amendments to the Iowa State Plan further clarifying its applicability to the provisions of the Vocational Education Acts of 1963, the State Plan was reapproved by the United States Office of Education on September 21, 1965 (59). This particular State Plan remained in effect until after the 1968 Amendments, and until a new State Plan (60) was submitted on June 30, 1969 to be approved by the United States Office of Education on September 24, 1969. The new State

Plan was known as the "1969 revision of the State Plan" and was prepared by personnel from the Division of Vocational Education which is now known as the Career Education Division of the Department of Public Instruction. In 1970, the 1969 revision was revised with annual revisions following thereafter. Annual revisions continue to be the practice and are for the purpose of assuring compliance with state and federal regulations, as well as for providing flexibility so that programming will reflect the most recent information available.

The 1970 revision of the State Plan (61, p. 3) included a requirement that:

A handbook of procedures shall be developed to supplement the State Plan. The handbook will develop in greater detail the procedures to be used in developing programs, services, and activities. . . .

To be more specific, it seems in order to list briefly what has been attributed to the Vocational Education Act of 1963 (87) and the Vocational Education Amendments of 1968 (88): 1) Programs are to be geared to labor market needs. 2) Programs are to provide training over the entire occupational spectrum, except for those jobs generally considered professional or which require the baccalaureate degree. 3) Funds may be transferred from one occupational category to another under the Smith-Hughes and George-Barden Acts. The state may transfer funds to one of its allotments under the permanent program of the new Act as amended by the 1968 Amendments. 4) Definitions of the occupational categories are broadened by the Acts. 5) Practical nurse education and highly skilled technician programs were made permanent. 6) Federal funds are authorized for the construction of area vocational schools for the first time.

7) Special emphasis is placed on continuous and periodical evaluation of progress. 8) Research and development command a very important place in the future of vocational education. 9) New state plans for vocational education were needed in most of the states. 10) State Plans need to be more comprehensive, provide procedures for annual revisions, and have built-in guidelines for long-range future occupational planning.

The Iowa State Plan (57) and the supplemental Iowa State Handbook (39) and amendments thereto do provide for the realization of the ten items enumerated in the foregoing paragraph.

Part I of the Iowa State Plan provides in sections 3.0 and 3.1 for the vocational education programs of Iowa to be geared to labor market needs. Section 3.1 provides vocational training for the entire educational spectrum.

Item 3 of the foregoing list may be handled by appealing to the United States Commissioner and is not found as a specific administrative guideline in the Iowa State Plan.

Broadened definitions of vocational categories are found in the State Plan (57). Part I, sections 3.1, 3.11, 3.12, 3.13, 3.14, and 3.15 make the State Plan provisions applicable to those enumerated in the Act of 1963, as amended in 1968.

Funds allocated by the George-Barden and Smith-Hughes Acts and the Practical Nurse Training program part of the Vocational Education Act of 1946, according to the Vocational Education Act of 1963 (87, p. 8) may be "transferred to and combined with one or more of the other allotments of such state." Iowa has shown to the satisfaction of the United States

Commissioner that transfer of such funds has not hindered but has promoted the cause of vocational education in the state. No special provisions have been provided for practical nursing in the State Plan, but many nursing programs are funded and operating in the area schools of Iowa.

Procedures for construction of area vocational education schools and buildings are provided for in section 1.9 and 3.23, Part I of the State Plan. This allows the state and area vocational schools to participate in the benefits of federal funding for facilities' construction.

Items 7 and 8 of the list of attributes are accomplished under sections 1.34, 1.5, and 5.0, of the State Plan which provide for research, experimentation, and evaluation of vocational programs.

The truth of items 9 and 10 in the list of attributes is evident from the comprehensive planning by the Iowa State Board of Public Instruction. The Iowa State Plan (60) approved by the United States Commissioner in September, 1969; the 1972-1973 Iowa State Plan approved by the Commissioner in November, 1972 and the amendments thereto, are evidence of the need for extensive and comprehensive planning to accommodate the provisions of the Vocational Education Act of 1963, and the Vocational Amendments of 1968. The supplemental Iowa State Handbook (39) and the projected planning in Part II of the Iowa State Plan contain evidence of Iowa's intentions to participate in the extensive funding provided by the Vocational Education Acts.

From this presentation, it can be seen that the Iowa State Plan for Vocational Education makes provision for utilization of services, activities, programs, and funding resulting from the provisions of the

Vocational Education Act of 1963 and the Vocational Education Amendments of 1968. It is evident that provisions have been made for the state of Iowa to cooperate fully with the United States Office of Education in its endeavors, through the Vocational Acts of the United States Congress, to provide vocational education to all segments of the population.

Whether the local area vocational schools and community colleges take advantage of the Iowa State Plan remains to be seen, however, and will only be determined by an investigation of the fifteen area schools and community colleges' vocational programming.

METHODS AND PROCEDURES

Data for this study included information obtained from the Iowa Department of Public Instruction pertaining to the fifteen area schools in the state of Iowa. Pertinent data were collected from the operational reports of the branches, divisions, and sections of the Department of Public Instruction (see Appendix B).

Assumptions

One major basic assumption was necessary: Federal funds authorized for transfer purposes by "supplementary vocational educational acts" as identified by the 1968 Amendments were assumed to be initially appropriated for the Vocational Education Act of 1963, as amended by the Vocational Education Amendments of 1968.

Further assumptions were necessary in this chapter to provide for suitable Methods and Procedures. Iowa's plan for the administration of vocational education under the Vocational Education Act of 1963 was approved in Washington in 1964 and under the Vocational Education Amendments of 1968 on September 24, 1969. Thus, it is possible to make comparisons of vocational-technical programming for the six fiscal years of 1968 through 1973. Funds allocated to the state of Iowa and subsequently dispersed to the fifteen area schools would naturally be used to expand the offerings, increase the number of current programs, and provide new programs to serve a larger number of vocational-technical students. A prevailing increase in the kinds of new programs offered by the

area schools could surely be attributed to the Vocational Education Act of 1963, as amended by the Vocational Education Amendments of 1968.

It has also been assumed, because of the additional federal funding, that more students would enroll for vocational programs, more students would complete the programs for which enrolled, and that because of these two factors, more federal dollars would be dispersed to the area schools. It was assumed that the more federal funding a school obtained, the more ancillary services, with more guidance and counseling services, would be provided.

Hypotheses

The following eleven null hypotheses were tested to determine the effects of the Vocational Education Act of 1963, as amended by the Vocational Education Amendments of 1968, and federal funding on program development in the fifteen area schools of the state of Iowa:

- 1) There is no significant relationship between the number of full-time vocational-technical programs offered by the selected instructional areas in the area schools of Iowa and the fiscal years in which the programs were offered.
- 2) There is no significant relationship between the number of full-time vocational-technical programs offered in the area schools of Iowa and the assessed valuation of the area schools.
- 3) There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the number of full-time vocational-technical programs offered by

the area schools.

- 4) There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the full-time-equivalent enrollment of vocational-technical students.
- 5) There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the assessed valuation of the area schools.
- 6) There is no significant relationship between the number of federal dollars received by the area schools and the assessed valuation per full-time-equivalent enrollment of vocational-technical students.
- 7) There is no significant relationship between the number of students completing the full-time vocational-technical programs in the area schools of Iowa and the number of programs being offered by the area schools.
- 8) There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the number of students completing the full-time vocational-technical programs of the area schools.
- 9) There is no significant relationship between the number of counselors employed by the area schools of Iowa and the number of federal dollars received by the area schools.
- 10) There is no significant relationship between the number of counselors employed by the area schools of Iowa and the number of full-time-equivalent enrollment of students in the full-time

vocational-technical programs of the area schools.

- 11) There is no significant relationship between the number of vocational-technical students completing the full-time programs in the area schools of Iowa and the number of counselors employed by the area schools.

Rationale

The purpose of the study was to analyze the impact of federal funds on vocational-technical program development in the fifteen area schools of Iowa. This could have been done on an individual area school basis and on a collective basis with the previously listed null hypotheses. In order to test the eleven null hypotheses, it was necessary to obtain considerable information concerning the fifteen area schools of Iowa from the Iowa Department of Public Instruction. Certain operational information in the form of computer printouts, working papers, and reports was obtained from the Iowa State Department of Public Instruction. This information has been tabulated in table form and can be found throughout the thesis.

Collection of Data

The Area Schools Division of the Iowa Department of Public Instruction was contacted for permission to obtain the necessary data from personnel in the Division and other support sections where necessary. Because of the organization of the area schools division it was not necessary to use a data instrument other than the table format used in this thesis

for the collection of data. A number of reports was examined by the investigator in the Iowa Department of Public Instruction offices and a number of published reports and computer printouts were obtained for careful analysis and study.

Analysis of the Data

Simple tabulations in table form allowed a comparison of data for the various variables being studied. These and other tabulations from reports, working papers, and computer printouts are in table form in the findings to show the effect of federal funding on the vocational-technical programs of the area schools.

The relationship of the variables or factors considered in the hypotheses can not be sufficiently evaluated through simple tabulation, however. Two basic statistical methods were used to measure the relationships presented in the null hypotheses.

The coefficient of correlation was used as one means of determining relationships between variables. Snedecor and Cochran (75, p. 122) when discussing the statistical methods for determining mutual relationship between two variables state:

The correlation coefficient is a measure of the degree of closeness of the linear relationship between two variables.

When presenting his case for the use of the coefficient of correlation, Freund (32, p. 355) said:

The statistic we have just introduced is, undoubtedly, the most widely used measure of the strength of the linear relationship between two variables. It indicates the goodness of the fit of a line fitted by the method of least squares and this, in turn,

tells us whether or not it is reasonable to say that there exists a linear relationship (correlation) between \underline{x} and \underline{y} . If \underline{r} is close to $\underline{0}$, the fit is poor and the relationship is very weak or nonexistent; if \underline{r} is close to $+1$ or -1 , the fit is good and this is indicative of a strong linear relationship between \underline{x} and \underline{y} .

The major purpose of the coefficient of correlation is to show the relationship between the variables as a single number depicting the extent to which the two variables are related. The problem also included dealing with differences in units for determination of relationship. The coefficient of correlation is independent of the variable units and may be considered as a pure number ratio without benefit of unit designation.

Because of the small number of scores available for each of the variables it was necessary to use a statistic that would make allowances for a small population that might be far from normal. The Spearman's rank correlation coefficient, which is the correlation coefficient between the ranked values of two paired variables, was calculated. The formula used for the computation of the Spearman's rank correlation coefficient may be expressed from Snedecor and Cochran (75, p. 194):

$$r_s = 1 - \frac{6 \sum d^2}{N(N^2 - 1)}$$

where:

$r_s = r$ = correlation between x and y

\sum = summation

d = differences between the ranks of corresponding observations, x and y

N = number of pairs of observations, x and y

The distribution free nonparametric chi square (30, p. 160) was the second method used in testing the null hypothesis of no significant relationship among or between the observations in Table 1 of this study. The formula used for this statistic was (30, p. 162):

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

where:

χ^2 = chi square

\sum = summation

O = observed frequencies

E = expected or theoretical frequencies

Like the Spearman's rank correlation coefficient, the chi square statistic was used with the data because the statistic requires fewer assumptions which simplify the required calculations for gaining suitable results in testing null hypotheses of no significant relationships.

The types of variables, the reliability of the data, and the exploratory nature of the study suggested the .05 level of significance be used. It was decided to accept a calculated value larger than the tabular or critical value at the .05 level of significance as the level at which the null hypothesis was rejected.

FINDINGS

Introduction

The purpose of this study was to analyze the effects of federal funding on the development of full-time preparatory vocational-technical programs operated by the fifteen area schools of Iowa.

The findings of the study are based on an analysis of data submitted to the Area Schools Division of the Department of Public Instruction by the fifteen area schools in Iowa and on an analysis of data generated within the Department of Public Instruction for a period of six fiscal years from 1968 through 1973. The data were extracted from publications, computer printouts, and operational reports of the Department of Public Instruction. Simple tabulation procedures, statistical analysis using chi square and Spearman's rank correlation coefficient were used in testing the null hypotheses and for evaluating the findings.

Presentation and Testing of Data

An examination of Table 1, containing data for testing null hypothesis one, reveals the number of full-time preparatory vocational-technical programs offered in the selected instructional areas for each of the six fiscal years with the corresponding percentage for each instructional area for each fiscal year. Additional information provided at the base of Table 1 shows the increase in total number of programs with the corresponding percentage for each of the succeeding five fiscal years following

Table 1. Number of full-time vocational-technical programs offered by the selected instructional areas and the fiscal years in which the programs were offered, with yearly instructional area percentages and total increases by fiscal year

Instructional area	Fiscal years											
	67-68		68-69		69-70		70-71		71-72		72-73	
	N	%	N	%	N	%	N	%	N	%	N	%
Agriculture	15	7	20	8	24	9	28	10	28	9	38	10
Distributive Education	9	5	12	5	15	6	16	6	19	7	24	7
Health occupations	35	17	40	16	40	16	46	16	46	15	61	17
Office occupations	35	17	47	19	44	17	53	19	56	19	68	19
Technical occupations	26	13	25	10	25	10	25	9	28	9	31	8
Trade & industrial	84	41	104	42	107	42	114	40	124	41	143	39
Total number of programs	204	100	248	100	255	100	282	100	301	100	365	100
Total increase over previous year	--	--	44	21	7	8	27	11	19	6	64	22
Total cumulative increase	--	--	44	21	51	25	78	38	97	47	161	79

fiscal 1968.

The growth which occurred in the selected instructional areas, as measured by the number of programs and as defined by the Vocational Education Act of 1963, amended by the Vocational Education Act of 1968, and as categorized by the Career Education Branch of the Iowa Department of Public Instruction, is shown in Table 1.

A chi square was computed for the purpose of analyzing the relationships among or between the instructional areas and the fiscal years. The computations produced a chi square of 6.88 and, when compared with the table value of 37.652 (32, p. 385) at the .05 level with 25 degrees of freedom, no significant relationship was indicated among or between the number of programs for the six years in the six selected instructional areas. The chi square statistic indicates the independence of the number of programs offered each year from the number offered during the other five years, as well as the independence of the number of programs offered in one instructional area from the other five instructional areas.

However, observations of the growth in full-time vocational-technical programs of Iowa in the selected instructional areas may be made. A study of Table 1 shows that there has been an increase in the number of vocational-technical programs offered in the area schools of Iowa over the six years. The yearly increases in the number of programs, as compared with the base year of fiscal 1968, from 44 in fiscal 1969, to 51 in fiscal 1970, to 78 in fiscal 1971, to 97 in fiscal 1972, and to 161 in fiscal 1973 provides evidence that there has been a decided increase in the number of programs offered each year of the study.

During the 1968 fiscal year there were 204 programs offered. This was 100 percent of the technical programs offered in the six selected instructional areas. Agriculture had seven percent of the total, distributive education five percent, health occupations 17 percent, office occupations 17 percent, technical occupations 13 percent, and trade and industrial 41 percent. These ratios remained about the same throughout the six fiscal years.

The number of programs offered in fiscal 1969 was 248, for an increase of 44 programs or 21 percent. In the 1970 fiscal year, there were 255 programs offered showing an increase of seven programs or an eight percent increase over the previous fiscal year, but an increase of 51 over the base year of fiscal 1968, for a cumulative percentage increase of 25 percent. The total of 282 vocational-technical programs offered in fiscal 1971 showed an increase of 27 programs or an increase of eleven percent over the previous year, but depicted a total increase of 78 over the base year of fiscal 1968 representing a cumulative percentage increase of 38 percent. In fiscal 1972, there were 301 vocational-technical programs offered by the area schools. This was an increase of 19 programs or a six percent increase over the previous fiscal year, but showed a total increase from the base year of 1968 of 97 programs. This was a cumulative percentage increase of 47 percent. The 1973 fiscal year depicted a yearly increase of 64 programs or a 22 percent increase over the previous year for the largest yearly increase of the six years. The addition of the 64 programs in fiscal 1973 brought the total additional vocational-technical programs over the six years from the base of fiscal 1968

through fiscal 1973 to 161 programs for a total percentage increase of 79 percent from fiscal 1968 through fiscal 1973. The greatest increase in terms of years was during fiscal 1973. This does not present the actual picture in terms of new programs, however since two instructional areas had a decrease of four programs over the six years, there were actually 165 new programs added. This would show a total six-year increase of 81 percent in new programs.

If the percentages in Table 1 are studied in relation to the total number of programs offered per year in relation to the total gain in programs offered per year in relation to the total gain in programs for each instructional area, a developmental pattern seems to be taking shape. The range in percentage of the total number of programs offered per year for each instructional area is from two to five percent. The instructional areas have been ranked from high to low, in terms of the number of programs offered for each of the six fiscal years: trade and industrial, office occupations, health occupations, technical occupations, agriculture, and distributive education. The six-year average corresponding percentage for each of the instructional areas is 41, 18, 16, 10, 9, and 6.

Further examination of the data in Table 1 indicates a different relationship in the development of programs. If the percentage of increase is computed between 1968 and 1973 for each instructional area, the distributive education offerings have increased 153 percent, office occupation offerings have increased 94 percent, health occupation offerings have increased 74 percent, trade and industrial offerings have increased

70 percent, and technical occupations offerings have increased 19 percent. However, a comparison of the proportions in Table 1 for the six instructional areas with relation to the total programs offered for fiscal 1968 and fiscal 1973 shows a decrease of three percent for distributive education, an increase of three percent for agriculture, and increase of two percent for office occupations, no increase or decrease for health occupations, a decrease of two percent for trade and industrial, and a decrease of five percent for technical occupations.

The increase of 161 vocational-technical programs over the six-year period leaves little room for doubt that there is a significant difference existing between the initial year of 1968 and the final year of 1973. It would be reasonable to assume that the Vocational Amendments of 1968 and the Iowa State Plan resulting from these amendments have provided considerable encouragement for the greater development of vocational-technical programs.

The first null hypothesis of no significant relationship between the number of full-time vocational-technical programs offered and the fiscal years in which they were offered was not refuted by the data. The growth in number and percentage of full-time vocational-technical programs is marked by the programs having developed independently in terms of instructional areas and years in which offered.

Other relationships were examined to further analyze the impact of federal funds on program development. Data for each of the six years plus an evaluation of the total data for all six fiscal years of 1968 through 1973 were examined. Relationships existing in the area schools

concerning the number of full-time vocational-technical programs, the assessed valuation per area school, the number of federal dollars received, and the full-time equivalent vocational-technical enrollment, were studied by year and by total for the six-year period.

Tables 2, 3, 4, 5, 6, and 7 contain the data for the four previously mentioned variables for each of the six fiscal years. Table 8 contains composite data for the four variables for the six fiscal years of 1968 through 1973. Table 9 lists the rank correlation coefficients as determined for the three relationships computed from the seven tables. These seven tables contain the necessary information for data analysis and for testing null hypotheses two, three, and four.

An analysis of the data in Tables 2 through 7 indicates a yearly increase in the number of new programs offered by the fifteen area schools, the assessed valuations for the fifteen area schools, and the full-time-equivalent enrollment in the vocational-technical programs of the fifteen area schools. This is not the case however with the number of federal dollars received annually by the area schools for support of these vocational-technical programs. Federal dollars received in 1969 showed an increase over the 1968 receipts, yet fiscals 1970, 1971, and 1972 each showed a decrease when compared with the fiscal 1969 year. Fiscal 1973 saw the largest number of federal dollars received for the support of the full-time vocational-technical programs in Iowa and also the largest number of new programs.

The number of programs offered increased from 204 in fiscal 1968 to 365 in fiscal 1973 for a growth of 79 percent. Assessed valuation went

Table 2. Number of full-time vocational-technical programs, assessed valuation in millions, number of federal dollars received and full-time-equivalent vocational-technical enrollment by each area school in Iowa for fiscal 1968

Area school	Number of full-time vocational-technical programs	Assessed valuation in millions	Number of federal dollars received	Full-time-equivalent vocational-technical enrollment
Area I	12	251	79998	212
Area II	7	399	64066	402
Area III	3	298	44158	118
Area IV	10	227	41660	227
Area V	14	605	76431	347
Area VI	10	294	51995	346
Area VII	19	452	130980	713
Area IX	16	529	114121	578
Area X	22	709	116398	603
Area XI	13	1031	208209	434
Area XII	17	330	74027	476
Area XIII	18	418	103381	273
Area XIV	9	195	35653	111
Area XV	21	333	204585	787
Area XVI	13	233	113289	276
Totals	204	6304	1458951	5903

Table 3. Number of full-time vocational-technical programs, assessed valuation in millions, number of federal dollars received and full-time-equivalent vocational-technical enrollment by each area school in Iowa for fiscal 1969

Area school	Number of full-time vocational-technical programs	Assessed valuation in millions	Number of federal dollars received	Full-time-equivalent vocational-technical enrollment
Area I	15	267	126035	325
Area II	8	399	108817	398
Area III	7	312	56456	171
Area IV	13	227	64431	324
Area V	15	605	126627	394
Area VI	10	294	86289	361
Area VII	23	452	206668	837
Area IX	24	597	195637	653
Area X	32	760	241111	938
Area XI	23	1107	321533	811
Area XII	20	413	170438	469
Area XIII	17	418	210235	343
Area XIV	8	195	46178	105
Area XV	20	333	216298	976
Area XVI	13	233	87709	304
Totals	248	6612	2264462	7409

Table 4. Number of full-time vocational-technical programs, assessed valuation in millions, number of federal dollars received and full-time-equivalent vocational-technical enrollment by each area school in Iowa for fiscal 1970

Area school	Number of full-time vocational-technical programs	Assessed valuation in millions	Number of federal dollars received	Full-time-equivalent vocational-technical enrollment
Area I	18	481	124438	470
Area II	8	443	94653	334
Area III	10	312	66942	203
Area IV	13	239	74725	355
Area V	19	626	119840	448
Area VI	11	328	73531	285
Area VII	23	475	220951	870
Area IX	19	643	147870	620
Area X	31	760	245031	920
Area XI	26	1207	299634	1061
Area XII	23	413	144887	482
Area XIII	15	456	189375	607
Area XIV	8	209	38505	143
Area XV	18	346	204169	712
Area XVI	13	269	98646	272
Totals	255	7207	2143197	7791

Table 5. Number of full-time vocational-technical programs, assessed valuation in millions, number of federal dollars received and full-time-equivalent vocational-technical enrollment by each area school in Iowa for fiscal 1971

Area school	Number of full-time vocational-technical programs	Assessed valuation in millions	Number of federal dollars received	Full-time-equivalent vocational-technical enrollment
Area I	20	478	108884	561
Area II	11	448	96122	371
Area III	10	314	63349	299
Area IV	17	262	68931	499
Area V	21	631	119598	515
Area VI	12	329	72534	313
Area VII	29	482	212681	1067
Area IX	18	663	152054	648
Area X	34	788	249674	1292
Area XI	27	1240	222342	1224
Area XII	25	458	137425	594
Area XIII	17	461	182345	561
Area XIV	9	204	36288	161
Area XV	19	343	181342	1062
Area XVI	13	274	88417	272
Totals	282	7375	1991986	9439

Table 6. Number of full-time vocational-technical programs, assessed valuation in millions, number of federal dollars received and full time-equivalent vocational-technical enrollment by each area school in Iowa for fiscal 1972

Area school	Number of full-time vocational-technical programs	Assessed valuation in millions	Number of federal dollars received	Full-time equivalent vocational-technical enrollment
Area I	21	497	94506	1036
Area II	11	468	70779	506
Area III	10	328	49433	735
Area IV	18	274	55251	760
Area V	21	656	95533	818
Area VI	13	335	57475	392
Area VII	30	498	187042	1598
Area IX	19	693	125681	1143
Area X	36	818	196374	1866
Area XI	33	1335	188249	2694
Area XII	27	481	113743	971
Area XIII	19	474	146796	883
Area XIV	10	217	30300	254
Area XV	20	349	141164	1106
Area XVI	13	286	67835	466
Totals	301	7709	1620161	15228

Table 7. Number of full-time vocational-technical programs, assessed valuation in millions, number of federal dollars received and full-time-equivalent vocational-technical enrollment by each area school in Iowa for fiscal 1973

Area school	Number of full-time vocational-technical programs	Assessed valuation in millions	Number of federal dollars received	Full-time-equivalent vocational-technical enrollment
Area I	26	509	125984	1050
Area II	14	477	89956	569
Area III	14	332	62536	854
Area IV	20	277	71658	736
Area V	21	662	119008	992
Area VI	16	341	59179	479
Area VII	32	509	240878	1571
Area IX	22	708	149955	1428
Area X	47	857	243473	2265
Area XI	40	1386	241963	2869
Area XII	34	506	200916	1063
Area XIII	26	483	353828	953
Area XIV	10	222	71759	268
Area XV	23	355	337204	966
Area XVI	20	295	151776	457
Totals	365	7919	2520073	16520

Table 8. Total number of full-time vocational-technical programs, total taxable assessment in millions, total number of federal dollars received and total full-time-equivalent vocational-technical enrollment for the six fiscal years of 1968 through 1973

Area school	Total number of full-time vocational-technical programs	Total assessment in millions	Total number of federal dollars received	Total full-time-equivalent vocational-technical enrollment
Area I	112	2483	659845	3654
Area II	59	2634	524393	2580
Area III	54	1896	342874	2380
Area IV	91	1506	376656	2901
Area V	111	3785	657037	3514
Area VI	72	1921	401003	2176
Area VII	156	2868	1199200	6656
Area IX	118	3833	885318	5070
Area X	202	4692	1292061	7893
Area XI	162	7306	1481930	9093
Area XII	146	2601	841436	4055
Area XIII	112	2710	1185960	3620
Area XIV	54	1242	258683	1042
Area XV	121	2059	1284762	5609
Area XVI	85	1590	607672	2047
Totals	1655	43126	11998830	62290

Table 9. A summary of Spearman's rank correlation coefficients by year, by total period under study, and by the first group of selected variables^a

Fiscal year	Paired variables		
	2 Number of full-time vocational-technical programs and assessed valuation of area schools	3 Number of federal dollars received and number of full-time vocational-technical programs	4 Number of federal dollars received and full-time-equivalent vocational-technical enrollment
1968	.56*	.74**	.72**
1969	.73**	.88**	.85**
1970	.79**	.85**	.97**
1971	.77**	.84**	.93**
1972	.81**	.86**	.89**
1973	.77**	.79**	.59*
1968 through 1973	.73**	.94**	.92**

^aPresented in Tables 2 through 8.

* A correlation coefficient of .51 with $N = 15$ is necessary for significance at the .05 level (32, p. 391).

** A correlation coefficient of .64 with $N = 15$ is necessary for significance at the .01 level (32, p. 391).

from \$6,304,000,000 in fiscal 1968 to \$7,919,000,000 in fiscal 1973 for a growth of 26 percent, while the full-time-equivalent enrollment of vocational-technical students increased from 5903 in fiscal 1968 to 16520 in fiscal 1973, or a growth of 180 percent. It can be noted that federal funds increased from \$1,458,951 in fiscal 1968 to \$2,520,073 in fiscal 1973 for a growth of 73 percent. Closer observation of the federal funding shows a growth of 55 percent between fiscal 1968 and fiscal 1969, with a percentage drop of 6 percent, 7 percent, and 11 percent respectively for fiscal years 1970, 1971, and 1972. The increase in federal funding from fiscal 1972 to fiscal 1973 was 56 percent.

In order to determine the magnitude and the significance of the relationship existing between any two variables in Tables 2, 3, 4, 5, 6, and 7, a Spearman's rank correlation coefficient was computed. When comparing the two variables, number of full-time vocational-technical programs with the assessed valuation, for each of the six fiscal years and for a combination of the fiscal years 1968 through 1973, the seven correlation coefficients were found to be significantly different from zero. Each computed correlation coefficient was tested against the critical values of a correlation coefficient with 13 degrees of freedom at the .05 level and the .01 level.

As presented in Table 9, column 2, the rank correlation coefficients for the two variables are either significant or highly significant. The critical values of the correlation coefficient computed on the two variables for the fifteen area schools were .51 at the .05 level and .64 at the .01 level. The calculated rank correlation coefficient of .56 for

fiscal 1968 was significant at the .05 level, while the calculated coefficients of .73, .79, .77, .81, and .77 were highly significant at the .01 level for fiscals 1969, 1970, 1971, 1972, and 1973. The .73 rank correlation coefficient for the combination of six years, fiscal 1968 through 1973, was highly significant when compared with the critical value of .64 at the .01 level. The magnitude of the relationship between the number of programs offered in the area schools and the assessed valuation of the area schools for the period under study was quite evident.

Squaring the correlation coefficient to determine what percent of the variation of one variable can be attributed to its association with the other variable makes it possible to observe changes in the magnitude of relationships from 1968 through 1973. The variation for fiscal 1968 was 31 percent; for 1969, 53 percent; for 1970, 62 percent; for 1971, 59 percent; for 1972, 66 percent and for 1973, 59 percent. Except for fiscal 1968, it is obvious that more than 50 percent of the variation in number of vocational-technical programs over the six fiscal years is accounted for by differences in assessed valuation. The correlation coefficient of .73 for the six fiscal-year composite indicates a highly significant relationship existing with 53 percent of the variation in number of vocational-technical programs offered caused by the differences in assessed valuation of the area school districts.

The second null hypothesis of no significant relationship between the number of full-time vocational-technical programs offered by the area schools and the assessed valuation of the area schools was not tenable in the results obtained when a Spearman's rank correlation coefficient

was computed for determining the possible relationship between the two variables. Obviously, there is a significant relationship between the number of full-time vocational-technical programs offered in the area schools and the assessed valuations of the area schools.

The comparison of the number of programs offered by the area schools with the number of federal dollars received by the area schools resulted in a highly significant correlation coefficient for each of the six fiscal years as well as for a combination of the six fiscal years of 1968 through 1973. For each of the fiscal years 1968 through 1973, the correlation coefficients were .74, .88, .85, .84, .86, and .79 respectively. For a combination of the six fiscal years, the correlation coefficient was .94. The critical values of the correlation coefficients for the two-paired variables for the fifteen area schools are .51 at the .05 level and .64 at the .01 level (32, p. 391). Column 3 in Table 9 shows all rank correlation coefficients as being highly significant at the .01 level for each fiscal year as well as for the combination of the six fiscal years of 1968 through 1973. The highly significant positive correlation coefficients are indicative of an increase in programming with an increase in federal funding.

The magnitude of the relationship between the two variables for each of the six fiscal years and for a combination of the six years can be easily determined by squaring the correlation coefficients in column 3, Table 9, to determine what percent of the variation of one variable can be attributed to its association with the other variable. The percent of variation for each of the six fiscal years of 1968 through 1973 was

55, 77, 72, 71, 74, and 62 respectively. The percent of variation for the combined six-year period was 88 percent.

The third null hypothesis of no significant relationship between the two variables, number of federal dollars received and the number of full-time vocational-technical programs offered, was not supported, since there was insufficient evidence to reject the null hypothesis. Each correlation coefficient as listed in column 3, Table 9 was highly significant and an observation of the percentages of variation shows a substantial relationship existing between the number of federal dollars received and the number of full-time vocational-technical programs.

A study of the two variables, number of federal dollars received by the area schools and the number of vocational-technical full-time-equivalent enrollments, and a computation of the Spearman's rank correlation coefficients for each year and for a combination of the six fiscal years of 1968 through 1973 produced correlation coefficients of .72, .85, .97, .93, .89, and .59 respectively. The correlation coefficient for a combination of the six fiscal years, 1968 through 1973 was .92. All coefficients of correlation as recorded in Table 9, column 4 were highly significant with the exception of the correlation coefficient of .59 for fiscal 1973. However, the correlation coefficient of .59 is significant at the .05 level of significance.

Looking at the magnitude of the relationship between the two variables, by squaring the correlation coefficient to obtain the percentage of variations in one variable that could be attributed to association with the other, produced the percentage of variation for each fiscal

year of 1968 through 1973 of 52, 72, 94, 86, 79, and 35 respectively. For a combination of the six fiscal years, the percent of variation was 85 percent.

The fourth null hypothesis of no significant relationship between the two variables, the number of federal dollars received and the number of full-time-equivalent vocational-technical enrollments could not be supported. Even though the magnitude of the relationships computed ranged from a correlation coefficient of .59 to .97 and the percentage of variation ranged from 35 to 94, each relationship was statistically significant. There was insufficient evidence to reject the null hypothesis.

Data tabulated in Tables 10 through 16 on the following pages contain information for making comparisons between the number of federal dollars received by the area schools, the assessed valuation of the area schools, and the assessed value per full-time-equivalent student in the area schools. It will be noted that the assessed value per full-time-equivalent student was determined by dividing the assessed value of the district by the total full-time-equivalent enrollments of the district, not just the vocational-technical students. Each student in an area school district has the same assessed valuation supporting him. Table 17 lists the rank correlation coefficients as computed for the two relationships of paired variables, number of federal dollars received with the assessed valuation and the number of federal dollars received with the assessed valuation per full-time-equivalent vocational-technical student.

An analysis of the data in Tables 10 through 16, shows the number of federal dollars received by the area schools and the assessed

Table 10. Number of federal dollars received, full-time-equivalent enrollment for all students, assessed valuation in millions, and assessed value per full-time-equivalent vocational-technical student by each area school in Iowa for fiscal 1968

Area school	Number of federal dollars received	Full-time-equivalent enrollment for all students	Assessed valuation in millions	Assessed value per full-time-equivalent vocational-technical student
Area I	79998	212	251	1183962
Area II	64066	1788	399	223154
Area III	44158	657	298	453577
Area IV	41660	227	227	1000000
Area V	76431	1634	605	370257
Area VI	51995	2110	294	139336
Area VII	130980	713	452	633941
Area IX	114121	1504	529	351729
Area X	116398	1750	709	405143
Area XI	208209	1115	1031	924664
Area XII	74027	476	330	693277
Area XIII	103381	898	418	465479
Area XIV	35653	530	195	367925
Area XV	204585	1394	333	238881
Area XVI	113289	1410	233	165248
Totals	1458951	16418	6304	383969

Table 11. Number of federal dollars received, full-time-equivalent enrollment for all students, assessed valuation in millions, and assessed value per full-time-equivalent vocational-technical student by each area school in Iowa for fiscal 1969

Area school	Number of federal dollars received	Full-time-equivalent enrollment for all students	Assessed valuation in millions	Assessed value per full-time-equivalent vocational-technical student
Area I	126035	436	267	612385
Area II	108817	1769	399	225551
Area III	56456	950	312	328421
Area IV	64431	379	227	598945
Area V	126627	1858	605	325619
Area VI	86289	2196	294	133880
Area VII	206668	1133	452	398941
Area IX	195637	1699	597	351383
Area X	241111	2723	760	279104
Area XI	321533	2084	1107	531190
Area XII	170438	786	413	525445
Area XIII	210235	1129	418	370239
Area XIV	46178	502	195	388446
Area XV	216298	1728	333	192708
Area XVI	87709	1552	233	150129
Totals	2264462	20924	6612	315001

Table 12. Number of federal dollars received, full-time-equivalent enrollment for all students, assessed valuation in millions, and assessed value per full-time-equivalent vocational-technical student by each area school in Iowa for fiscal 1970

Area school	Number of federal dollars received	Full-time-equivalent enrollment for all students	Assessed valuation in millions	Assessed value per full-time-equivalent vocational-technical student
Area I	124438	650	481	740000
Area II	94653	1872	443	236645
Area III	66942	1053	312	296296
Area IV	74725	442	239	540724
Area V	119840	2237	626	279839
Area VI	73531	2316	328	141623
Area VII	220951	1372	475	346210
Area IX	147870	1765	643	364306
Area X	245031	3275	760	232061
Area XI	299634	2440	1207	494672
Area XII	144887	1127	413	366460
Area XIII	189375	1551	456	294004
Area XIV	38505	551	209	379310
Area XV	204169	1487	346	232683
Area XVI	98646	1607	269	167393
Totals	2143197	23745	7207	303517

Table 13. Number of federal dollars received, full-time-equivalent enrollment for all students, assessed valuation in millions, and assessed value per full-time-equivalent vocational-technical student by each area school in Iowa for fiscal 1971

Area school	Number of federal dollars received	Full-time-equivalent enrollment for all students	Assessed valuation in millions	Assessed value per full-time-equivalent vocational-technical student
Area I	108884	797	478	599749
Area II	96122	1896	448	236287
Area III	63349	1276	314	246082
Area IV	68931	647	262	404946
Area V	119598	2452	631	257341
Area VI	72534	2411	329	136458
Area VII	212681	1634	482	294982
Area IX	152054	1869	663	354735
Area X	249674	4088	788	192760
Area XI	222342	3400	1240	364706
Area XII	137425	1255	458	364940
Area XIII	182345	1524	461	302493
Area XIV	36288	676	204	301775
Area XV	181342	1977	343	173495
Area XVI	88417	1736	274	157834
Totals	1991986	27638	7375	266843

Table 14. Number of federal dollars received, full-time-equivalent enrollment for all students, assessed valuation in millions, and assessed value per full-time-equivalent vocational-technical student by each area school in Iowa for fiscal 1972

Area school	Number of federal dollars received	Full-time equivalent enrollment for all students	Assessed valuation in millions	Assessed value per full-time equivalent vocational-technical student
Area I	94506	1375	497	361455
Area II	70779	1903	468	245927
Area III	49433	1595	328	205643
Area IV	55251	881	274	311010
Area V	95533	2691	656	243776
Area VI	57475	2315	335	144708
Area VII	187042	2091	498	238164
Area IX	125681	2289	693	302752
Area X	196374	4240	818	192925
Area XI	188249	4914	1335	271673
Area XII	113743	1450	481	331724
Area XIII	146796	1896	474	250000
Area XIV	30300	683	217	317716
Area XV	141164	1977	349	176530
Area XVI	67835	1674	286	170848
Totals	1620161	31974	7709	241102

Table 15. Number of federal dollars received, full-time-equivalent enrollment for all students, assessed valuation in millions, and assessed value per full-time-equivalent vocational-technical student by each area school in Iowa for fiscal 1973

Area school	Number of federal dollars received	Full-time-equivalent enrollment for all students	Assessed valuation in millions	Assessed value per full-time-equivalent vocational-technical student
Area I	125984	1500	509	339333
Area II	89956	1897	477	251450
Area III	62536	1686	332	196916
Area IV	71658	862	277	321346
Area V	119008	2720	662	243382
Area VI	59179	2210	341	154299
Area VII	240878	2171	509	234454
Area IX	149955	2616	708	270642
Area X	243473	4621	857	185458
Area XI	241963	5369	1386	258149
Area XII	200916	1795	506	281894
Area XIII	353828	2090	483	231100
Area XIV	71759	719	222	308762
Area XV	337204	2323	355	152820
Area XVI	151776	1665	295	177177
Totals	2520073	34244	7919	231252

Table 16. Total number of federal dollars received, total full-time-equivalent enrollment for all students, total taxable assessment in millions and total assessed valuation per full-time-equivalent vocational-technical student by each area school in Iowa for the fiscal years of 1968 through 1973

Area school	Total number of federal dollars received	Total full-time-equivalent enrollment for all students	Total taxable assessment in millions	Total assessed value per full-time-equivalent vocational-technical student
Area I	659645	4970	2483	499598
Area II	524393	11125	2634	236764
Area III	342874	7217	1896	262713
Area IV	376656	3438	1506	438045
Area V	657037	13592	3785	278473
Area VI	401003	13558	1921	141688
Area VII	1199200	9114	2868	314681
Area IX	885318	11742	3833	326435
Area X	1292061	20697	4692	226700
Area XI	1481930	19322	7306	378118
Area XII	841436	6889	2601	377558
Area XIII	1185960	9088	2710	298195
Area XIV	258683	3661	1242	339252
Area XV	1284762	10886	2059	189142
Area XVI	607672	9644	1590	164869
Totals	11998830	154943	43126	278335

Table 17. A summary of Spearman's rank correlation coefficients by year, by total period under study, and by the second group of selected variables^a

Fiscal year	Paired variables	
	2 Number of federal dollars received and assessed valuation per area school	3 Number of federal dollars received and assessed valuation per full-time-vocational-technical student
1968	.68**	.13
1969	.81**	.28
1970	.77**	.01
1971	.85**	.07
1972	.84**	-.08
1973	.52*	-.24
1968 through 1973	.79**	.03

^aPresented in Tables 10 through 16.

*A correlation coefficient of .51 with N = 15 is necessary for significance at the .05 level (32, p. 391).

**A correlation coefficient of .64 with N = 15 is necessary for significance at the .01 level (32, p. 391).

valuation in millions of the area schools tabulated as in Tables 2 through 7. Additional information, full-time-equivalent enrollment for all students at the area schools and the assessed valuation per full-time-equivalent vocational-technical student, has been added. The information in these tables is necessary for an examination of the variables in testing the null hypotheses five and six in this study.

It can be noted that the federal funds increased from \$1,458,951 in fiscal 1968 to \$2,520,073 in fiscal 1973 for an increase of 73 percent. Closer observation shows an increase of 55 percent between 1968 and 1969 with an increase of 56 percent between 1972 and 1973. Federal funds decreased at the rate of six, seven, and eleven percent for the other three years of 1970, 1971, and 1972. While the receipt of federal funds was fluctuating over the six-year period, the full-time-equivalent enrollment was steadily increasing from 16,418 students in 1968 to 34,244 students in 1973 for a percentage increase of 208 percent. Assessed valuation went from \$6,304,000,000 to \$7,919,000,000 over the six-year period for a percentage increase of 26 percent. The great increase of 208 percent in students and the relatively small 26 percent increase in assessed valuation resulted in a yearly decrease in assessed valuation per full-time-equivalent vocational-technical student. The rate of decrease in assessed valuation per full-time-equivalent student for the six-year period was 60 percent.

An inspection of the assessed valuation as compared with the number of federal dollars received by the area schools for each of the six fiscal years and for a combination of the six years found one rank

correlation coefficient significant at the .05 level and the remaining six coefficients highly significant at the .01 level. The rank correlation coefficients recorded in Table 17, column 2 were .68, .81, .77, .85, .84, and .52 for each of the six years 1968 through 1973 and .79 for a combination of the six years. Only fiscal 1973 with a correlation coefficient of .52 was not significant at the .01 level.

When the correlation coefficients were squared for observation of the magnitudes of relationship between the two variables, the percentage of variation for each fiscal year of 1968 through 1973 was 46, 66, 59, 72, 71, and 27. The percentage of variation for a combination of the six fiscal years was 62 percent.

The fifth null hypothesis of no significant relationship between the two variables, the number of federal dollars received and the assessed valuation of the area schools, was not supported. The correlation coefficients ranged widely from .52 to .85 with the variation common to both variables ranging from 27 percent to 72 percent. There was a highly significant relationship at the .01 level between the two variables for 1968 through 1972. For fiscal 1973, the relationship was significant at the .05 level. For a combination of the six fiscal years, the relationship was highly significant at the .01 level.

When comparisons were made between the two variables showing the number of federal dollars received and the assessed valuation per full-time-equivalent vocational-technical student, the rank correlation coefficients for the six fiscal years of 1968 through 1973 were .13, .38, .01, .07, -.08, and -.24. The rank correlation coefficient for a

combination of the six fiscal years was .03. None was significant when compared with a critical value of .51 at the .05 level of significance.

When the correlation coefficients were squared to obtain the percent of variation common to both variables, the resulting percentages were two, eight, zero, zero, one and six for the six fiscal years of 1968 through 1973. The percent of variation for a combination of the six fiscal years was zero.

The sixth null hypothesis of no significant relationship between the two variables, number of federal dollars received by the area schools and the assessed valuation per full-time-equivalent enrollment of vocational-technical students, was supported. There was insufficient evidence to reject the null hypothesis.

Tables 18 through 22 contain data tabulated for the purpose of making comparisons concerning the number of vocational-technical programs, the number of counselors assigned to the area schools as determined by the Iowa Public School Employment Data Forms (63), the number of federal dollars received by the area schools, the number of full-time-equivalent vocational-technical students, and the number of students completing vocational-technical programs. The five fiscal years of 1969 through 1973 were used for these determinations. Fiscal 1968 was eliminated from this part of the study because of lack of available data on number of counselors and the incompleteness of data on program completions, especially in the two-year vocational-technical programs. Table 23 lists

Table 18. Number of full-time vocational-technical programs, number of counselors employed, number of federal dollars received, number of full-time-equivalent vocational-technical students, and number of students completing full-time vocational-technical programs by each area school in Iowa for fiscal 1969

Area school	Number of full-time vocational-technical programs	Number of counselors employed	Number of federal dollars received	Number of full-time-equivalent vocational-technical students	Number of students completing full-time vocational-technical programs
Area I	15	1	126035	325	143
Area II	8	6	108817	398	136
Area III	7	1	56456	171	100
Area IV	13	1	64431	324	103
Area V	15	5	126627	394	190
Area VI	10	4	86289	361	280
Area VII	23	2	206668	837	466
Area IX	24	4	195637	653	260
Area X	32	6	241111	938	320
Area XI	23	4	321533	811	226
Area XII	20	2	170438	469	213
Area XIII	17	4	210235	343	181
Area XIV	8	1	46178	105	63
Area XV	20	4	216298	976	470
Area XVI	13	2	87709	304	119
Totals	248	47	2264462	7409	3270

Table 19. Number of full-time vocational-technical programs, number of counselors employed, number of federal dollars received, number of full-time-equivalent vocational-technical students, and number of students completing full-time vocational-technical programs by each area school in Iowa for fiscal 1970

Area school	Number of full-time vocational-technical programs	Number of counselors employed	Number of federal dollars received	Number of full-time-equivalent vocational-technical students	Number of students completing full-time vocational-technical programs
Area I	18	3	124438	470	307
Area II	8	5	94653	334	124
Area III	10	3	66942	203	97
Area IV	13	2	74725	355	109
Area V	19	5	119840	448	244
Area VI	11	4	73531	285	99
Area VII	23	2	220951	870	511
Area IX	19	5	147870	620	305
Area X	31	6	245031	929	390
Area XI	26	5	299634	1061	395
Area XII	23	4	144887	482	273
Area XIII	15	4	189375	607	281
Area XIV	8	2	38505	143	64
Area XV	18	5	204169	712	422
Area XVI	13	4	98646	272	205
Totals	255	59	2143197	7791	3826

Table 20. Number of full-time vocational-technical programs, number of counselors employed, number of federal dollars received, number of full-time-equivalent vocational-technical students, and number of students completing full-time vocational-technical programs by each area school in Iowa for fiscal 1971

Area school	Number of full-time vocational-technical programs	Number of counselors employed	Number of federal dollars received	Number of full-time-equivalent vocational-technical students	Number of students completing full-time vocational-technical programs
Area I	20	3	108884	561	239
Area II	11	5	96122	371	228
Area III	10	4	63349	299	160
Area IV	17	1	68931	499	203
Area V	21	5	119598	515	239
Area VI	12	4	72534	313	121
Area VII	29	1	212681	1067	605
Area IX	18	4	152054	648	332
Area X	34	16	249674	1292	689
Area XI	27	12	222342	1224	540
Area XII	25	4	137425	594	376
Area XIII	17	5	182345	561	281
Area XIV	9	2	36288	161	105
Area XV	19	7	181342	1062	380
Area XVI	13	4	88417	272	152
Totals	282	77	1991986	9439	4650

Table 21. Number of full-time vocational-technical programs, number of counselors employed, number of federal dollars received, number of full-time-equivalent vocational-technical students, and number of students completing full-time vocational-technical programs by each area school in Iowa for fiscal 1972

Area school	Number of full-time vocational-technical programs	Number of counselors employed	Number of federal dollars received	Number of full-time-equivalent vocational-technical students	Number of students completing full-time vocational-technical programs
Area I	21	4	94506	1036	392
Area II	11	6	70779	506	240
Area III	10	2	49433	735	277
Area IV	18	1	55251	760	314
Area V	21	5	95533	818	284
Area VI	13	5	57475	392	299
Area VII	30	1	187042	1598	695
Area IX	19	7	125681	1143	400
Area X	36	17	196374	1866	543
Area XI	33	16	188249	2694	556
Area XII	27	4	113743	971	778
Area XIII	19	5	146796	883	313
Area XIV	10	1	30300	254	99
Area XV	20	6	141164	1106	336
Area XVI	13	6	67835	466	185
Totals	301	86	1620161	15228	5711

Table 22. Number of full-time vocational-technical programs, number of counselors employed, number of federal dollars received, number of full-time-equivalent vocational-technical students, and number of students completing full-time vocational-technical programs by each area school in Iowa for fiscal 1973

Area school	Number of full-time vocational-technical programs	Number of counselors employed	Number of federal dollars received	Number of full-time-equivalent vocational-technical students	Number of students completing full-time vocational-technical programs
Area I	26	4	125984	1050	520
Area II	14	5	89956	569	236
Area III	14	2	62536	854	174
Area IV	20	1	71658	736	229
Area V	21	6	119008	992	299
Area VI	16	6	59179	479	221
Area VII	32	2	240878	1571	693
Area IX	22	8	149995	1428	593
Area X	47	15	243473	2265	715
Area XI	40	15	241963	2869	735
Area XII	34	4	200916	1063	783
Area XIII	26	6	353828	953	366
Area XIV	10	1	71759	268	112
Area XV	23	5	337204	966	345
Area XVI	20	7	151776	457	182
Totals	365	87	2520073	16520	6203

Table 23. A summary of Spearman's rank correlation coefficients by year, by total period under study, and by the third group of selected variables^a

Fiscal year	Paired variables				
	2 Number of students completing full-time vocational-technical programs and number of full-time vocational-technical programs	3 Number of federal dollars received and number of students completing full-time vocational-technical programs	4 Number of counselors employed by the area schools and number of federal dollars received by the area schools	5 Number of counselors employed by the area schools and full-time vocational-technical enrollment	6 Number of students completing full-time vocational-technical programs and number of counselors employed by the area schools
1969	.70**	.76**	.59**	.65**	.56*
1970	.79**	.95**	.52*	.50	.39
1971	.89**	.94**	.58*	.44	.46
1972	.92**	.74**	.57*	.42	.17
1973	.87**	.63*	.25	.26	.24

^aPresented in Tables 18 through 22.

* A correlation coefficient of .51 with $N = 15$ is necessary for significance at the .05 level (32, p. 391).

** A correlation coefficient of .64 with $N = 15$ is necessary for significance at the .01 level (32, p. 391).

the rank correlation coefficients as computed for the five relationships of paired variables recorded in the table.

An examination of Tables 18 through 22 for fiscal years 1969 through 1973 shows that considerable changes were taking place in the number of full-time vocational-technical programs operating, the number of available counselors, the number of federal dollars received, the number of full-time-equivalent vocational-technical students, and the number of students completing the programs. The number of programs being offered by each area school was fluctuating, but the total number of programs was increasing year by year at an average increase of 29.25 programs per year, ranging from seven in 1970 to 64 in 1973. The total increase from 1969 through the 1973 fiscal year was 117 programs, or an increase of 47 percent for the five years. When ranked in terms of the number of programs offered, no one area school ranked the same for all five years.

The number of counselors increased from 47 in 1969 to 87 in 1973. This was an annual average growth of ten counselors per year, with the greatest magnitude of 18 between 1970 and 1971. The number of counselors only increased by one between 1972 and 1973. When ranked in terms of the number of counselors per area school, no one school ranked the same for all five years.

When dealing with the federal funding for the five fiscal years of 1969 through 1973, it can be seen that funds decreased from \$2,264,462 in 1969 to \$2,143,197 in 1970, to \$1,991,986 in 1971, and to \$1,620,161 in 1972, while an increase to \$2,520,073 is observable in 1973 showing

an increase of 56 percent over the 1972 fiscal year and an increase of eleven percent over the 1969 fiscal year. When ranked in terms of federal funds received, one area school maintained the same rank for the five fiscal years.

An examination of the Tables 18 through 22 indicates more than twice as many full-time-equivalent vocational-technical students were enrolled in the area schools of Iowa in fiscal 1973 than in fiscal 1969. The increase from 1969 to 1970 was 382, from 1970 to 1971 it was 1648, from 1971 to 1972 it was 5789, and from 1972 to 1973 it was 1292.

The percentage increase for the five years was 123 percent. Two of the area schools maintained the same ranking over the five-year period when all area schools were ranked according to the number of full-time vocational-technical students for each of the five fiscal years of 1969 through 1973.

When the numbers of students completing the full-time vocational-technical programs for the five fiscal years were studied, an overall increase of 90 percent was observable. There was an increase from the 3270 in 1969 to 3826 in 1970, to 4650 in 1971, to 5711 in 1972, to 6203 in 1973 for a total increase of 2933 students over the five fiscal years from 1969 through 1973.

When ranked according to the number of student completions for each of the five years, one area school maintained the same rank for all five years.

Five of the relationships existing among data in Tables 18 through

22 were computed by the Spearman's rank correlation coefficient method to determine what portion of the variation in one variable was attributable to differences in the other variable.

The first comparisons were made between the two variables, number of vocational-technical programs offered and number of vocational-technical students completing the programs, resulting in rank correlation coefficients, as recorded in Table 23, column 2, of .70 for 1969, .79 for 1970, .89 for 1971, .92 for 1972, and .87 for 1973. All of the rank correlation coefficients were highly significant at the .01 level of significance.

When making a percentage of variation comparison by squaring the correlation coefficient, the variation common to both variables for each of the five fiscal years was found to be 48, 62, 79, 85, and 76.

The seventh null hypothesis of no significant relationship between the two variables, number of students completing the programs in the area schools and the number of programs being offered by the area schools, was not supported. The highly significant coefficients, as recorded in Table 23, column 2, and the high percentages of variation common to both variables for each of the five fiscal years show a highly significant relationship at the .01 level of significance between the two variables for each of the five fiscal years.

Spearman's rank correlation coefficients were computed to determine the relationships between the two variables, number of federal dollars received by the area schools and the number of vocational-technical

completions. The correlation coefficients were .76, .95, .94, .74, and .63 for the fiscal years of 1969 through 1973. An examination of the rank correlation coefficients in Table 23, column 3, for the five fiscal years found four indicating a highly significant relationship between the two variables at the .01 level and one indicating a significant relationship at the .05 level.

When determining the percent of variation that might be attributed to program completions by differences in the number of dollars received in federal funds, the percentages were 58, 90, 88, 55, and 40 respectively for the fiscal years of 1969, 1970, 1971, 1972, and 1973.

The eighth null hypothesis of no significant relationship between the two variables, number of federal dollars received by the area schools and the number of students completing the programs of the area schools, could not be supported.

An analysis of the two variables, number of federal dollars received by the area schools and the number of counselors per area school, found the rank correlation coefficients to be .59 for fiscal 1969, .52 for fiscal 1970, .58 for fiscal 1971, .57 for fiscal 1972, and for fiscal 1973 the correlation coefficient was .25. As computed and recorded in Table 23, column 4, those for 1969, 1970, 1971, and 1972 were significant at the .05 level, with the correlation of .25 for fiscal 1973 not meeting the test for significance at the critical value of .51 at the .05 level.

Analyzing the magnitude of the relationship between the two

variables, by squaring the correlation coefficient to obtain the percent of variation in one of the variables that might be attributed to the other, the percentages were found to be 35 for 1969, 27 for 1970, 34 for 1971, 32 for 1972, and only six percent for 1973.

The ninth null hypothesis of no significant relationship between the two variables, number of counselors employed by the area schools and the number of federal dollars received by the area schools, could not be supported for fiscal years 1969, 1970, 1971, and 1972 but was supported for fiscal 1973. There was a significant relationship at the .05 level for the first four years. There was insufficient evidence to reject the null hypothesis for fiscal 1973.

An examination of the relationship between the two variables, number of counselors employed by the area schools and the number of full-time-equivalent vocational-technical students, as recorded in Table 23, column 5, produced a highly significant rank correlation coefficient of .65 for 1969, but nonsignificant rank correlation coefficients of .50 for 1970, .44 for 1971, .42 for 1972, and .26 for 1973 were found.

When examining the magnitude of the relationship between the two variables resulting from the squaring of the correlation coefficients, it was discovered that forty-two percent of the variation in one of the variables for 1969 could be caused by its association with the other variable, but only 25 percent in 1970, 19 percent in 1971, 18 percent in 1972 and seven percent in 1973 could be considered as the portion of the variance attributable to differences in variables.

The tenth null hypothesis of no significant relationship between

the two variables, counselors employed by the area schools and the number of full-time-equivalent enrollment of students, could not be supported for fiscal 1969. The rank correlation coefficients for fiscal 1970 through 1973 did support the null hypothesis. There was insufficient evidence to reject the null hypothesis for 1970 through 1973.

When the rank correlation coefficients were computed and recorded in Table 23, column 6, for an existing relationship between the two variables, number of counselors employed by the area schools and the number of vocational-technical students completing programs, a correlation coefficient of .56 was obtained for 1969, .39 for 1970, .46 for 1971, .17 for 1972, and .24 for 1973. The correlation coefficient of .56 for 1969 was significant at the .05 level while those for 1970, 1971, 1972, and 1973 were not significant.

When squaring the correlation coefficients to determine the magnitude of the relationships, thirty-one percent of the variation for 1969 could be attributed to the differences in the other variable. The percentages for 1970, 1971, 1972, and 1973 were 15, 21, 3, and 6 respectively.

The eleventh null hypothesis of no significant relationship between the two variables, number of vocational-technical students completing the programs and the number of counselors employed by the area schools, could not be supported for fiscal year 1969, but was supported for fiscal years 1970, 1971, 1972, and 1973. There was a significant relationship at the .05 level for fiscal 1969. There was insufficient evidence to reject the null hypothesis for 1970 through 1973.

Based on the analysis of the data contained in this chapter for

testing the eleven null hypotheses, there was insufficient evidence to reject null hypotheses one and six, but there was sufficient evidence to reject null hypotheses two, three, four, five, seven, and eight, for all years under study. Null hypothesis nine was rejected for four of five fiscal years, null hypothesis ten was rejected for one of five fiscal years, and null hypothesis eleven was rejected for one of five fiscal years.

DISCUSSION

The distribution of federal funds to the states for supporting the Vocational Education Act of 1963 and the Vocational Education Amendments of 1968, for the years 1968 through 1973, included \$11,998,830 for supporting the full-time vocational-technical programs in Iowa's fifteen area schools. These funds included \$1,458,951 in 1968, \$2,264,462 in 1969, \$2,143,197 in 1970, \$1,991,986 in 1971, \$1,620,161 in 1972, and \$2,520,073 in 1973. It should be noted that the amount of the federal funds decreased annually after 1969 until 1973 when there was an increase of 56 percent.

The pattern of program development included 204 programs in 1968, 248 in 1969, 255 in 1970, 282 in 1971, 301 in 1972, and 365 in 1973 for an increase of 161 programs or a 79 percent increase in the number of programs over the six fiscal years. It should be noted that the largest increase occurred in 1973 with 64 new programs. This was the year that the federal funds were increased 56 percent. The 204 programs in 1968 were distributed among the areas of agriculture (15-7),¹ distributive education (9-5), health occupations (35-17), office occupations (35-17), technical occupations (26-13), and trade and industrial (81-41). While the number of programs increased from 204 to 365 over the six-year period, the percent of total programs in each of the instructional areas remained rather constant.

¹(15 programs, 7 percent).

The assessed valuation of the area school districts increased 26 percent during the period of 1968 through 1973. The assessed valuation per full-time-equivalent student decreased from \$383,969 in 1968 to \$231,252 in 1973. This decrease in assessed valuation per full-time-equivalent student was due to the rapid growth in enrollments in the area schools--an increase of 208 percent in terms of full-time-equivalent enrollment.

The significant relationship of assessed valuation to number of programs and to the number of federal dollars may be in part due to the concentration of population and business and industry in an area.

The enrollment of full-time-equivalent vocational-technical students increased from 5903 in 1968, 7409 in 1969, 7791 in 1970, 9439 in 1971, 15,228 in 1972, and to 16,520 in 1973. The rather steady increase in enrollments, with the exception of 1972 which had a large increase in enrollment may be noted. The large increase in enrollments for 1972 may be due to the 27 new programs started in fiscal 1971. Most of these programs were two-year programs with some programs being started in midyear.

The number of students completing full-time vocational-technical programs increased from 3270 in 1968, 3826 in 1970, 4650 in 1971, 5711 in 1972, to 6203 in 1973.

The number of counselors employed in the fifteen area schools increased from 47 in 1969, 59 in 1970, 77 in 1971, 86 in 1972, to 87 in 1973. While enrollments increased two and one half times, and completions nearly doubled, the number of counselors increased approximately 85 percent during the six-year period.

When the fifteen area schools were ranked in relationship to the independent variables for the five and six years of the study, 1968 through 1973, a rather stable ranking occurred. It would appear that a pattern of rank in relationship to the variables studied was beginning to appear.

The purpose of the study was to determine the effect of federal dollars on vocational-technical program development. The number of programs, the full-time vocational-technical enrollment (except 1973), the assessed valuation (except 1973), and the number of student-completions (except 1973), were related to the number of federal dollars in a highly significant way. The number of counselors (except 1973) were significantly related to the number of federal dollars. Federal funds were increased by 56 percent in 1973. The number of programs was increased by 64. The remainder of the variables studied did not increase in relation to the increase in federal dollars during fiscal 1973.

Eleven hypotheses were studied. These were stated in the null form. Only two failed to be rejected. These were the relationship of the number of programs to the fiscal year, and the relationship of the number of federal dollars to the assessed valuation.

Hypotheses tested for the relationship of number of programs to assessed valuation, federal dollars to number of programs, federal dollars to full-time enrollment, federal dollars to assessed valuation, student-completions to number of programs, and federal dollars to number of completions, were rejected. The variables were significantly related.

Hypotheses testing the relationship of number of counselors to

federal dollars, number of counselors to student enrollment, and number of counselors to student-completions, were rejected in part. Factors that might have influenced the findings were the large increase of federal funds in 1973, the increase of only one counselor, 83 to 84 in 1973, and the failure to increase the number of counselors in relationship to the growth of enrollment.

SUMMARY

This investigation was designed to analyze the effects of federal funds obtained under the Vocational Education Act of 1963, as amended, on the full-time preparatory vocational and technical education programs operated by the fifteen area schools of Iowa. Data consisted of information obtained from working papers, computer printouts, and publications of the Iowa Department of Public Instruction.

A variety of methods was used to determine the effectiveness of the federal funding. Eleven hypotheses were selected for testing the relationships of data obtained from working papers, reports, and publications of the Iowa Department of Public Instruction. Simple tabulation, Spearman's rank correlation coefficient and the chi square statistic were used for statistical analysis of the data for testing the eleven null hypotheses.

Eleven null hypotheses were posed and tested for the purpose of analyzing the relationships existing between each set of variables paired for study. The eleven null hypotheses and the results of statistically testing the data for each hypothesis follows:

Hypothesis One: There is no significant relationship between the number of full-time vocational-technical programs offered by the selected instructional areas in the area schools of Iowa and the fiscal years in which the programs were offered.

Hypothesis one was not rejected. The results of the chi square test for independence produced a value below the .05 table value. There was

insufficient evidence for rejecting the null hypothesis.

Hypothesis Two: There is no significant relationship between the number of full-time vocational-technical programs offered by the area schools of Iowa and the assessed valuation of the area schools.

Hypothesis two was rejected. There was a significant relationship at the .05 level of significance for the 1968 fiscal year and a highly significant relationship at the .01 level of significance for the five fiscal years of 1969 through 1973. There was a highly significant relationship at the .01 level of significance for a combination of the six fiscal years.

Hypothesis Three: There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the number of full-time vocational-technical programs offered by the area schools.

Hypothesis three was rejected. There was a highly significant relationship at the .01 level of significance for each of the six fiscal years, 1968 through 1973, and for a combination of the six fiscal years.

Hypothesis Four: There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the full-time-equivalent enrollment of vocational-technical students.

Hypothesis four was rejected. There was a significant relationship at the .05 level of significance for the 1973 fiscal year, and there was a highly significant relationship at the .01 level of significance for the five fiscal years of 1968 through 1972. There was also a highly significant relationship at the .01 level of significance for a combination of

the six fiscal years.

Hypothesis Five: There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the assessed valuation of the area schools.

Hypothesis five was rejected. Analysis of the data produced results indicating there was a highly significant relationship at the .01 level of significance for five fiscal years, 1968 through 1972, a significant relationship at the .05 level of significance for fiscal 1973, and a highly significant relationship at the .01 level of significance for a combination of the six fiscal years.

Hypothesis Six: There is no significant relationship between the number of federal dollars received by the area schools and the assessed valuation per full-time-equivalent enrollment of vocational-technical students.

Hypothesis six was not rejected. There was insufficient evidence to reject the null hypothesis for any one of the fiscal years of 1968 through 1973, or for a combination of the six fiscal years.

Hypothesis Seven: There is no significant relationship between the number of students completing the full-time vocational-technical programs in the area schools of Iowa and the number of programs being offered by the area schools.

Hypothesis seven was rejected. There was a highly significant relationship at the .01 level of significance for each of the five fiscal years 1969 through 1973.

Hypothesis Eight: There is no significant relationship between the number of federal dollars received by the area schools of Iowa and the number of students completing the full-time vocational-technical programs of the area schools.

Hypothesis eight was rejected. There was a highly significant relationship at the .01 level of significance for fiscal years 1969 through 1972 and a significant relationship at the .05 level of significance for fiscal 1973.

Hypothesis Nine: There is no significant relationship between the number of counselors employed by the area schools of Iowa and the number of federal dollars received by the area schools.

Hypothesis nine was rejected for the fiscal years of 1969, 1970, 1971, and 1972. Hypothesis nine was not rejected for fiscal 1973. Statistical analysis of the data showed there was a significant relationship at the .05 level of significance for the first four years. There was insufficient evidence to reject the null hypothesis for the last fiscal year.

Hypothesis Ten: There is no significant relationship between the number of counselors employed by the area schools of Iowa and the number of full-time-equivalent enrollment of students in the full-time vocational-technical programs of the area schools

Hypothesis ten was rejected for fiscal 1969, but was not rejected for fiscals 1970, 1971, 1972, and 1973. There was a highly significant relationship at the .01 level of significance for the 1969 fiscal year. There was insufficient evidence to reject the null hypothesis for fiscal

years 1970 through 1973.

Hypothesis Eleven: There is no significant relationship between the number of vocational-technical students completing the full-time programs in the area schools of Iowa and the number of counselors employed by the area schools.

Hypothesis eleven was rejected for fiscal 1969 but was not rejected for fiscals 1970 through 1973. There was a significant relationship at the .05 level of significance for the 1969 fiscal year. There was insufficient evidence to reject the null hypothesis for fiscal years 1970 through 1973.

Suggestions for Further Study

As data were collected from the Area Schools Division of the Iowa Department of Public Instruction, questions arose which suggested additional studies being conducted concerning the area schools of Iowa. Factors selected for investigation in this study were chosen because it was felt they represented serious items for consideration when determining the effects of federal funding on vocational-technical programming.

Some of the areas open for further study as indicated by the questions which arose are listed below:

- i) A longitudinal study of the students completing the vocational-technical programs of the area schools is in order. How well the students perform on-the-job over a period of time utilizing the education obtained would be a good measure of the effectiveness of funded programs.

- 2) A study to determine appropriate means for reporting vocational-technical program data to the Iowa Department of Public Instruction for federal fund payments or reimbursement would be of considerable value to the area schools of Iowa.
- 3) A study of the procedures used in establishing new vocational-technical programs and the resulting justification for federal funding should be made.
- 4) A study to determine whether the area schools are developing identifiable vocational-technical programs for the handicapped and disadvantaged would be in order in terms of the amounts of funding provided in the Acts for these groups.
- 5) A study of the procedures used by the area schools in the selection of students for the vocational-technical programs would be in order, since the area schools of Iowa are considered as "open door" institutions.
- 6) A study of the employment of counselors for the area schools with attention directed at the number employed, their responsibilities, and their qualifications.

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APPENDIX A

AREA VOCATIONAL SCHOOLS AND AREA COMMUNITY COLLEGES
IN THE STATE OF IOWA

The characteristics concerning the vocational and technical programs of the following fifteen area schools of Iowa were examined for the purposes of this study.

- | | |
|-----------|---|
| Area I | Northwest Iowa Area Vocational Technical School
Calmar, Iowa |
| Area II | North Iowa Area Community College
Mason City, Iowa |
| Area III | Iowa Lakes Community College
Estherville, Iowa |
| Area IV | Northwest Iowa Vocational School
Sheldon, Iowa |
| Area V | Iowa Central Community College
Fort Dodge, Iowa |
| Area VI | Iowa Valley Community College
Marshalltown, Iowa |
| Area VII | Hawkeye Institute of Technology
Waterloo, Iowa |
| Area IX | Eastern Iowa Community College
Davenport, Iowa |
| Area X | Kirkwood Community College
Cedar Rapids, Iowa |
| Area XI | Des Moines Area Community College
Ankeny, Iowa |
| Area XII | Western Iowa Tech
Sioux City, Iowa |
| Area XIII | Iowa Western Community College
Council Bluffs, Iowa |
| Area XIV | Southwestern Community College
Creston, Iowa |
| Area XV | Indian Hills Community College
Ottumwa, Iowa |
| Area XVI | Southeastern Community College
Burlington, Iowa |

APPENDIX B

Personnel of the Iowa Department of Public Instruction were quite helpful in providing information from publications, working papers, and printouts for use in this study. Personnel from the following branches, divisions, and sections helped in furnishing data.

Area Schools and Career Education Branch

Area Schools Division

Fiscal Control Section

Career Education Division

Post Secondary Section

Planning and Management Information Branch

Management Information Division

Pupil Personnel Services Branch

Special Education Division

Guidance Services Section