

**CURRICULA AND THE COORDINATOR'S ROLE
IN POST HIGH SCHOOL AGRICULTURAL
MECHANICS TECHNICAL TRAINING PROGRAMS**

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This is to certify that the

thesis entitled

CURRICULA AND THE COORDINATOR'S ROLE IN POST HIGH SCHOOL
AGRICULTURAL MECHANICS TECHNICAL TRAINING PROGRAMS

presented by

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ABSTRACT

CURRICULA AND THE COORDINATOR'S ROLE IN POST HIGH SCHOOL AGRICULTURAL MECHANICS TECHNICAL TRAINING PROGRAMS

By

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Purposes. The purposes of this study were: (1) to assess the importance of role activities as perceived by coordinators so that important activities will be included as a part of their professional educational activities; (2) to summarize opinions from coordinators so that practices selected could be implemented in program planning and evaluation; (3) to study curricula of existing agricultural mechanics technical training programs to determine if they provide for the activities and practices rated high by coordinators.

Method. The curricula of three types of training institutions were compared by determining the percentage of credit hours classified as: (1) general, (2) sales related, (3) product related, (4) service related.

Teacher role activities, characteristics of quality programs, and additional concepts for in-service training of coordinators were analyzed by means of responses on a questionnaire/opinionnaire. The role activities were selected from four functions for coordination of programs. The respondents expressed their perceptions of importance of role activities on a five-point scale. The nonparametric chi-square statistic was used as a test to determine coordinator homogeneity. The

mean scores for items in Part II, III and IV of the questionnaire/opinionnaire were used to determine preferred characteristics and segments of programs and underlying educational concepts.

Findings and Interpretations. The findings that are concluded are based on the analysis of the coordinator responses to the role activities, conditions for quality programs and educational concepts. The findings of the study were analyzed within the framework of the aforementioned purposes.

1. Coordinators identified role activities as being very important. The very important activities in teaching were: in the collection and use of materials, models and specimens; in program evaluation procurement of strengths and weaknesses as seen by employers and students; in planning the involvement of industry personnel to help organize the curriculum; in student service, counseling and record keeping; and in-service contacts with industry and professional educators.

2. Conditions for quality programs included: supervised work experience in equipment dealerships' businesses of three months in length after a year of instruction was preferred over simulated work in the laboratory. Criteria for student selection and flexibility in training programs were considered desirable components of quality programs.

3. Colleges and universities emphasized general courses more than did community/junior colleges and vocational/technical institutes. Sales related courses in each type of institution received the least emphasis. The differences in programs in the three types of institutions did not cause coordinators to give statistically different responses.

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It was concluded that some degree of difference of responses within a given type of institution was found and was considered desirable and essential in providing for programs capable of innovating changes to serve better the rapidly growing industry.

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CHAPTER I

INTRODUCTION

THE PROBLEM

There is a growing interest in, and concern for, vocational and technical education in this country. This has been prompted primarily by the ever-increasing need for more technically trained people, plus the growing demand of the untrained and the underemployed who are seeking a greater share of the nation's wealth. In 1964 Harris pointed out that the educational background of 58 per cent of the working population in 1930 was the equivalent of the eighth grade of school or less, and he predicted that in 1970 educational requirements for employment for 50 per cent of the population would be junior college or technical institute training (thirteenth and fourteenth year equivalents).¹

Rapid technological change has brought about the need for the education and training of greater numbers and more kinds of skilled technicians to serve as specialists in the fields of applied physical and biological sciences. The United States Department of Health, Education, and Welfare states that:

¹Norman C. Harris, presentation to Southern Regional Education Board Legislative Work Conference, Williamsburg, Virginia, 1964.

Technicians are becoming an increasingly essential part of the scientific and management team for research, development, production, and provision of special services in all fields of applied science. The team is comprised of professional scientists, specially-trained technicians, and skilled production, laboratory or service workers.²

Grant Venn, currently Director, National Academy for School Executives, American Association of School Administrators, in a report of a study in the early 1960's for the American Council on Education, emphasized the national concern with the shortage of personnel in technical occupations and the need for increased training efforts in this area due to automation and other technological advances.³

State and local developments in vocational-technical education that have taken place since World War II have been an effort to bridge the gap between technological advancement and the lack of qualified personnel. Such states as Connecticut and New York in the Northeast; Pennsylvania in the Middle Atlantic area; Kentucky and North Carolina in the Southeast; Minnesota, Michigan and Wisconsin in the Midwest-Great Lakes region; California in the West, and most recently Oregon, Washington, and Montana in the Pacific Northwest, have provided legislation which permits state area schools, community and junior colleges, and technical institutes to provide post-secondary technical education.⁴

²United States Department of Health, Education, and Welfare, Office of Education, Criteria for Technical Education: A Suggested Guide (Washington, D. C.: Government Printing Office, 1968), foreword.

³Grant Venn, Man, Education and Work (Washington, D. C.: American Council on Education, 1965), p. v, and preface.

⁴Harold T. Smith, Education and Training for the World of Work, A Vocational Program for Michigan (Kalamazoo: W. E. Upjohn Institute for Employment Research, 1963).

National concern for technical education has been exemplified by the National Defense Education Act of 1958, the Area Redevelopment Act of 1961, Manpower Development and Training Act of 1962, the Vocational Education Act of 1963, and the Higher Education Facilities Act of 1963; and more recently, Congress has again indicated its awareness of this need by passing the Vocational Educational Amendments of 1968, Public Law 90-576, to the Vocational Education Act of 1963, without a dissenting vote in either house.

Congress, in passing the Vocational Education Act of 1963, set the tone for an increased national effort when it deemed that:

. . . persons of all ages in all communities of each state will have ready access to vocational training or retraining which is of high quality, which is realistic in the light of actual or anticipated opportunity for gainful employment, and which is suited to their needs, interests, and ability to benefit from such training.⁵

The Amendments (1968) expanded the omnibus provisions of the 1963 Act to encompass the following population and broad general purposes:

. . . 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 . . . and those in post-secondary schools . . . 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.⁶

⁵United States Congress, Public Law 88-210, 88th Congress, H.R. 4955, December 18, 1963, p. 1.

⁶United States Congress, Public Law 90-576, 90th Congress, H.R. 18266, Title I, Part A, Section 101, October 16, 1968.

The Vocational Education Amendments of 1968 offer great potential for increased programs and opportunities, including technician education programs for public and private post-secondary educational institutions. The Act provides grants to states to assist them in conducting educational programs. Ninety per cent of these funds are for basic vocational-technical programs and 10 per cent are for research and training in vocational-technical education.

The Higher Education Facilities Act of 1963 had as its stated purpose: ". . . to assist the nation's institutions of higher education . . . to accommodate mounting student enrollments and to meet demands for skilled technicians."⁷

This special emphasis in a major piece of higher education legislation has marked implications for vocational and technical education. It has specific implications for post-secondary vocational schools because of a trend to place this type of training in post-secondary institutions. This trend was expressed in 1963 in another national document--the report of a "panel of consultants" appointed at the request of the President of the United States by the Secretary of Health, Education, and Welfare⁸ to review and evaluate the then current National Vocational Education Acts and to make recommendations for improving the program. In the final report made to the President and to the people of the United States, the panel emphasized the following points:

⁷Venn, op. cit., p. 127.

⁸United States Office of Education, Education for a Changing World of Work, Report of the Panel of Consultants on Vocational Education (Washington: Government Printing Office, 1963), pp. 135, 259.



The scope and the level of the Area vocational and technical programs varies widely. Some schools include agriculture and business training; many of them limit their offerings to the industrial field. The latter schools are mainly concerned with providing training for the skilled trades, though recently many of them have developed programs for the technical occupations. With the increased demands of industry for technically-trained personnel, this phase of training is now receiving more attention.⁹

One result of increasing demands for technically-trained personnel, as well as the state and national concern for the availability of educational programs to train highly skilled technicians, has been an increase in the number, size, and variety of such programs. As has been previously noted, the education of technicians was not until recently recognized as so essential as to require the involvement of large numbers of institutions. Because the number of schools has been small, the special nature of technician education programs has been somewhat obscured.

For this study, the following are deemed to be the more important groupings that hold expectations for the professional role of the agricultural mechanics coordinators:

1. Coordinators of agricultural mechanics technical training programs at colleges and universities.
2. Coordinators of agricultural mechanics technical training programs at community/junior colleges.
3. Coordinators of agricultural mechanics technical training programs at vocational/technical institutes.

Since it is not only conceivable but highly probable that the perceived importance of the expected professional role of coordinators

⁹Venn, op. cit., p. 127.

may vary among these groups, this study is concerned with the perceived importance of the professional role components of coordinators among the three groupings and operating practices associated with providing quality training programs.

General Purposes of the Study

The general purposes for making this study were:

1. To assess the importance of role activities as perceived by coordinators so that important activities will be included as a part of their professional educational activities.
2. To summarize opinions from coordinators so that practices selected could be implemented in program planning and evaluation, and
3. To study curricula of existing agricultural mechanics technical training programs to determine if they provide for the activities and practices rated high by coordinators.

Specific Objectives of the Study

The specific objectives for conducting this study were: (1) to identify areas of work performed by coordinators related to the training program, (2) to determine role activities that coordinators feel most important to an agricultural mechanics technical training program, (3) to seek approved practices in quality programs for technician education in agricultural mechanics, and (4) to analyze existing curricula by dividing them into four major divisions.

SIGNIFICANCE OF THE STUDY

In establishing the significance of this study, it was appropriate to view agricultural mechanics technical training in its present setting. It is appropriate to identify the trends that exist in agricultural mechanics technical training programs and, consequently, the role activities of the coordinators. The different curricula and perceived role activity importance of coordinators will in different situations provide insight into the need for this study.

One hundred years ago, 90 per cent of the population of the United States lived on farms. Today, 7 per cent of the total population lives on farms. The trend in farm population is expected to level out at $\frac{3}{2}$ to 4 per cent.¹⁰ L. R. Kanetake states:

The number of farms is decreasing; however, the size of the farms is increasing in acreage. One hundred years ago each farm worker supplied the needs for only four other Americans. Today, he must provide for 33 other people. The conclusion that we draw is that there must be more mechanization on farms.

Farming has actually made more progress than industry. Tractors as well as other items of farm equipment have taken over to produce more and to cut down the labor necessary to sustain our population and to provide food for other countries as well.

Trained specialists are needed to develop, sell, and maintain the complex farm equipment. An agricultural technician in the eyes of the farm equipment industry is anyone who has had some specialized training in the technical area and who

¹⁰ L. R. Kanetake, Executive Assistant to Vice President, J. I. Case Company, Racine, Wisconsin, speech, "The Importance of Technical Training for the Farm Equipment Business," given at a Training Institute for Teachers of Technical Programs in Agriculture, State University of New York, Agricultural and Technical College, Cobleskill, New York, August, 1966.

is applying that training in a practical way. A technician can be such in varying degrees. He may be a person who mechanically checks out operations of a machine, follows a test, or performs some other function to which he is assigned, or he may be engaged in some action which has a greater degree of responsibility but is somewhat less than that assigned to the fully qualified engineer. A technician can have varying degrees of responsibility dependent upon his abilities and training.¹¹

Mr. Kanetake concluded with the following statements:

1. Many technician-training programs await the trained and qualified person in the farm equipment industry.
2. The individual seeking training in this area should have interest in it, ambition to succeed, preferably some agricultural background or experience, and leadership qualities.
3. The farm equipment industry stands ready to share its "know how" and to contribute in any way it can with personnel, equipment, study aids, and the like, to help initiate and operate such programs.
4. While learning, the trainee can pick up experience and some of his expenses through placement training.
5. The industry will help in any practical way it can to promote the manpower development and training programs.¹²

Definition of Terms

For the purposes of this study, the following definitions are assumed to be pertinent and relevant:

1. Coordinator. The professional educator who has the responsibility of the agricultural mechanics technical training programs is known as the coordinator. He may, as components of his role, supervise other staff members, teach, do administrative work, counsel

¹¹Ibid.

¹²Ibid.

students, perform public relations duties, supervise student work experience, and conduct research.

2. Agricultural machinery industry. That industry which manufactures, distributes, and services the machinery and equipment used in agriculture.

3. Agricultural mechanics. Agricultural mechanics relates to the development, marketing, application, operation, servicing, and maintenance of power and machinery necessary in agricultural production.

4. Function. A process involving closely related activities within a single industry which are essential for the success of the industry is known as a function.

5. Post high school education. Education beyond the high school graduation requirements, but less than a baccalaureate degree, is referred to as post high school education in this study.

6. Respondents. Respondents refers to the coordinators of agricultural mechanics technical training programs who provided judgments and opinions. They are often referred to in this study as the population.

7. Retail dealership. A unit in that phase of the agricultural machinery industry which sells equipment, parts, and service directly to farmers is known as a retail dealership.

8. Role activity. An activity that is done within a function.

9. Roles. Roles are sets of behavior perceptions which describe the work done by a particular performer (coordinator) or group of performers (in this instance, coordinators of agricultural mechanics technology) in a particular situation or similar situations.

10. Supervised work experience. An employment period in which the student trainee received work experience and training under the direction and supervision of an experienced dealership employer in the work areas of shop, parts, management, sales, and set-up is referred to as supervised work experience.

11. Technical education. Technical education refers to a curriculum designed to prepare the student for sub-professional occupational competency in which success is dependent largely upon technical information and an understanding of the laws of service and technology as applied to modern design, production, distribution, and service occupations.

12. Training program. The training program includes all the educational experiences required to train a competent technician for job entry into agricultural mechanics.

GENERAL PROCEDURES

This study included the entire population of one hundred coordinators of agricultural mechanics technician training programs in colleges or universities, community or junior colleges, and vocational or technical institutes within the continental limits of the United States as listed in the 1966-67 mimeographed pamphlet of the Department of Health, Education, and Welfare, Office of Education, Division of Vocational and Technical Education,¹³ and from the listed agricultural

¹³U. S. Department of Health, Education, and Welfare, Office of Education, "Directory of One-Year and Two-Year Post High School Institutions which Offer Programs of Instruction in Agriculture" (Washington, D. C.: Government Printing Office, 1966), pp. 1-12. (Mimeographed.)

mechanics technical training programs in the official business magazine of the agricultural and industrial equipment industry.¹⁴ It was an effort to account for as many as possible of the population of coordinators for established training programs within the continental boundaries of the United States.

The study was limited to those coordinators who had a program of instruction in agricultural mechanics technical training in operation for at least one calendar year's duration or longer. This served to eliminate the responses of coordinators involved in beginning training programs.

The questionnaire/opinionnaire¹⁵ responses were obtained from respondents who were asked to react to functions and items which had been selected from the literature pertinent to this area of study by the researcher, and which had been evaluated by a jury. The responses expressed by the respondents were assumed to be based upon their professional judgment and experience with programs of agricultural mechanics technical training.

¹⁴"Where They're Training Mechanics," Implement and Tractor, 82(14):26-29 (June 21, 1967).

¹⁵See Appendix F, p. 83.

CHAPTER II

TECHNOLOGICAL ADVANCEMENT AND CHANGES IN EDUCATIONAL PROGRAMS

Technological advances have changed the educational needs of technicians. Lee A. Dubridge describes how technology has changed the industrial processes from a former emphasis upon manipulative powers to an emphasis upon cognitive powers.¹ This shift is reflected in changes occurring in the distribution of the labor force resulting in a de-emphasis on production and an increased emphasis on service occupations.

The impact of technological developments caused many educators, who are responsible for initiating and directing programs for technicians, to be concerned with the relevancy of the training program. The special nature of such programs can be ascertained from an analysis of the definition of a technician and of technical education--what technicians must know, what special ability they must possess, and what they must be able to do.

The trend to provide more extensive vocational-technical training in post-secondary schools was further emphasized in the Sixty-fourth Yearbook of the National Society for the Study of Education:

¹Lee A. Dubridge, "Educational and Social Consequences," Automation and Technological Change (Englewood Cliffs: Prentice-Hall, 1962), p. 30.



One could say that the future of vocational education belongs to the post-high-school institutions, provided of course that the inference is not made that this point of view suggests a lack of enthusiasm for high school programs. As long as students tend to drop out of high school and as long as half of the high school graduates go to work immediately, there will continue to be intensive interest in and concern about vocational-technical education at the high school level. But that the trend in vocational education is toward more intensive development in post-high-school institutions there can be no doubt.²

The prospect of increased federal, state and local funds, and the recognized national need as stated by national study committees and panels for vocational-technical education and training in post-secondary schools signify the need for a systematic and thorough examination of the many factors relating to technician training in agricultural mechanics education in the nation.

A variety of conditions have coalesced to create a pressure upon the educational system to change and become more responsive to the needs of students and society. Change may be accomplished by maintaining, expanding and improving existing programs, or by developing new programs to meet the needs of persons not gaining the skills to function in agricultural mechanics programs now offered. Continual review and evaluation of the educational and training programs will be necessary to achieve the most efficient and effective programs. One must question whether present programs are relevant and if they are providing a meaningful preparation for efficient and effective service in agricultural mechanics.

²Melvin L. Barlow, A Platform for Vocational Education in the Future, Sixty-fourth Yearbook, Part I, National Society for the Study of Education (Chicago: University of Chicago Press, 1965), p. 287.



The organizing of elements of an agricultural mechanics curriculum is relatively new in current literature. Because of the lack of specific identification and organization of curricular elements, and because of diverse interpretations of curriculum, the organizing elements have not been identified as to their significance in developing curricula at the post-secondary school level. However, concepts, skills and values are the most commonly identified organizing elements used in educational programs. Content is selected to fulfill the stated objectives; evaluation is done to determine the extent to which the stated objectives have been fulfilled.

One task of this study has been to analyze the total curriculum that contributes to and supports the agricultural mechanics curricula in selected programs of colleges/universities, community/junior colleges, and post-secondary vocational/technical centers.

Technicians must have the following special abilities according to Prakken:

1. Proficiency in the use of the disciplined and objective scientific method of inquiry and observation; and in the application of the basic principles, concepts, and laws of physics, chemistry, and/or biological science pertinent to the individual's field of technology.
2. Facility with mathematics; ability to use algebra and usually trigonometry as tools in the development, definition, or quantification of scientific phenomena or principles according to the requirements of the technology.
3. A thorough understanding and facility in the use of the materials, processes, apparatus, procedures, equipment, methods, and techniques commonly used to perform laboratory, field, or clinical work.
4. An extensive knowledge of a field of specialization, with an understanding of the application of the underlying physical or biological sciences as they relate to the

engineering, health, agricultural or industrial processing or research activities that distinguish the technology of the field.

5. Communication skills that include the ability to record, analyze, interpret and transmit facts and ideas orally, graphically, or in writing with complete objectivity.³

Business and industry expect trained technicians to possess skills essential for job entry, and to perform those technical tasks that are demanded in a local community. Therefore, any investigation of technical education programs in agricultural mechanics must of necessity begin with those aspects of curriculum considered to be fundamental. Criteria for technician programs have been published by the United States Department of Health, Education, and Welfare,⁴ and are recognized as a prerequisite of industry in the form of measurable and predictable achievement on an individual basis in problem solving and communication.⁵ Therefore, systematic instruction in mathematics, science, and communication skills should be given.

In order that post-secondary vocational-technical programs be effective, there exists the necessity for having coordinators who have an understanding of the goals and objectives of occupational education and the expertise to implement suitable programs.⁶

³John Prakken (ed.), Technician Education Yearbook (Ann Arbor, Michigan: Prakken Publications, Inc., 1963), p. 11.

⁴United States Department of Health, Education, and Welfare, Criteria for Technical Education: A Suggested Guide (Washington, D. C.: U. S. Government Printing Office, 1968), p. 3.

⁵J. E. Casey, "What Do Business and Industry Want from Vocational Education?" The American School Board Journal, October, 1966, p. 45.

⁶United States Department of Health, Education, and Welfare, Office of Education, National Conference on Post-Secondary Vocational-Technical Education, San Antonio, Texas, November 5-7, 1969, p. v, and Introduction.

In a speech at a training institute for teachers of technical programs in agriculture, Foote, chairman of Agricultural Technology at Farmingdale, New York, advocated the combination of knowledge and teaching ability. He stressed the need for technical agricultural education personnel to have a strong commitment for being of service to the students.⁷

Arnold reports in a study that there is a need for recognizing, identifying, and relating the functions of techniques in industry to curricula which would best assure occupational competence. He found that programs of study to prepare technicians must provide subject matter and skill development in areas consistent with occupational requirements.⁸

Dealership managers must consider long-range plans as to how, when, and where they will secure the competent employees they need. Many have given much time and thought to the problem, and some dealerships are already involved in cooperation with post high school agricultural mechanics technical training programs.

Increased cooperation, leadership, and support by dealers are imperative for the success of an educational program of this type. With success of these programs will come the long-range solution to the presently limited supply of adequately trained personnel needed

⁷Norman Foote, "A Training Institute for Teachers of Technical Programs in Agriculture," American Vocational Journal, 43(1):42 (January, 1968).

⁸Joseph P. Arnold, "A Study of Recommendations for Technical Education Curricula," American Vocational Journal, 43(2):42-43 (February, 1968).

to continue the operation of a successful and profitable agricultural equipment dealership.

Stitt and Wolf, in a 1967 study concerning 270 responding dealerships from a total of 654 dealerships in Ohio, found that the 270 dealers estimated that they would have to hire 1,474 persons by 1971. Of these 1,474 people hired, 939 would be to fill new openings in the dealerships, and 535 would be for replacement purposes.⁹ The total number of dealership employees as reported at the beginning of their study was 1,488. By 1971, the additional employees would be almost a 100 per cent increase, or 5.46 new employees per dealership. If this were representative of all the dealerships as listed in Table I, page 18, a total of 82,800 additional dealership employees would be needed by 1971. Assuming that the non-respondents in the Ohio study would respond as the 270, it could be concluded that the 59 per cent were weak and unlikely to exist, or if existing, not grow and replacement being their only demand for new (replacement) employees, would still require nearly 8,000 per year in the United States.

Implement and Tractor reported that schools and the military services provided the source of a little more than one-fifth of the new service employees. Thirty-one per cent came from other dealerships.¹⁰

Only five years ago, few schools offered training in agricultural equipment service. Since then, the rapid growth of training

⁹Thomas R. Stitt and Willard H. Wolf, "270 Ohio Dealers Size Up Their Employee Needs," Implement and Tractor, 82(25):34 (December 7, 1967).

¹⁰Gerald G. Shirel, "Is There a Crisis in Manning Our Shops?" Implement and Tractor, 82(14):23 (June 21, 1967).

TABLE I

NUMBER OF AGRICULTURAL IMPLEMENT DEALERS IN U. S. - JANUARY 31, 1967
AS REPORTED BY FARM AND INDUSTRIAL EQUIPMENT INSTITUTE

State	Agri.* only	Agri.** & Ind.	State	Agri.* only	Agri.** & Ind.
Alabama	117	114	Nevada	12	23
Arizona	29	38	New Hampshire	7	23
Arkansas	152	126	New Jersey	36	36
California	116	187	New Mexico	45	39
Colorado	154	63	New York	277	253
Connecticut	9	29	North Carolina	235	143
Delaware	21	13	North Dakota	373	86
Florida	66	108	Ohio	419	235
Georgia	190	160	Oklahoma	254	83
Idaho	112	54	Oregon	70	71
Illinois	627	303	Pennsylvania	277	277
Indiana	367	213	Rhode Island	3	7
Iowa	759	147	South Carolina	109	72
Kansas	470	148	South Dakota	215	104
Kentucky	194	156	Tennessee	177	140
Louisiana	108	93	Texas	580	303
Maine	43	50	Utah	49	39
Maryland	82	57	Vermont	36	35
Massachusetts	26	38	Virginia	148	146
Michigan	348	199	Washington	103	74
Minnesota	640	164	West Virginia	53	61
Mississippi	164	118	Wisconsin	467	175
Missouri	399	175	Wyoming	51	33
Montana	142	66	Alaska	1	4
Nebraska	426	116	Hawaii	...	10

U. S. Total

* Dealerships dealing in agricultural machinery only 9,758
** Dealerships combining agricultural and industrial machinery 5,407

programs for agricultural mechanics has occurred because (1) the customer demands the service backup more than ever before, and (2) dealers are recognizing what is at stake in their future service occupations. They devote time to serving on curriculum advisory committees for technician training programs; they donate training aids; and they eagerly hire the graduates of these programs.¹¹

In an Iowa Study, Kahler found that service personnel are more valuable if they possess, in addition to specific skills, an understanding of the agricultural machinery business as a whole.¹² These findings point out three important factors to consider when recruiting service employees. First, the prospective employee should possess a broad agricultural background. The experience gained while farming will provide the understandings basic to performing these skills. Second, requirements for initial employment as a service employee demand more than an agricultural background provides by itself. There is a need for additional training in agriculture, business management, and business operation. The dealer should seek a person with formal training in these areas. Third, as indicated by Kahler on Table II, page 20, and Table III, page 21, a person employed as a mechanic in an agricultural machinery dealership must possess technical know-how in the field of mechanics and agriculture. In addition, he must be able to meet and communicate with the customer, and impart some technical knowledge to him.

¹¹"Getting the Service Job Done," Implement and Tractor, 83(1): 31 (January 7, 1968).

¹²Allen Kahler, "What Mechanics Have to Know," Implement and Tractor, 79(16):23-24 (July 21, 1964).



TABLE II

IMPORTANCE RATINGS OF THE CAPABILITIES OF
FARM EQUIPMENT SERVICE PERSONNEL¹³
(Based on a Mean Score of 4.0)

Competencies	Mean Score			
	Employer		Employee	
	Needed	Possessed	Needed	Possessed
<u>Understanding of</u>				
Wearability of machine parts	3.4	2.8	3.2	2.8
Basic functions of each machine and machine part	3.6	3.1	3.5	3.1
Types of transmissions	3.6	2.9	3.4	3.8
Diesel power	3.6	2.8	3.4	3.8
Power development and transmission	3.4	2.9	3.3	3.0
Relationship of lubricants to working parts of machines	3.6	3.1	3.4	3.1
Various metals used in machinery construction	3.4	2.4	2.8	2.4
<u>Ability to</u>				
Locate failures and make repairs quickly and efficiently	3.5	3.1	3.4	3.2
Follow factory instructions in machine assembly and operation	3.6	3.2	3.7	3.4
Adjust and repair carburetors and electrical systems	3.7	3.2	3.6	3.7
Adjust and repair diesel fuel injectors and fuel pumps	3.7	3.2	3.7	3.5
Paint farm equipment	3.4	2.9	3.7	3.0
Use a hynometer in testing and improving the operation of internal combustion engines	3.2	2.6	2.6	2.9
Detect incorrect assembly or adjustment	3.4	3.1	3.4	3.3
Calibrate farm machines	3.7	3.2	3.7	3.3
Determine when parts need replacing	3.5	3.0	3.5	3.0
Use both arc and oxy-acetylene welders in making special process welds	3.7	3.1	3.6	3.4
Operate honing equipment	3.3	2.7	3.2	2.8
Associate machine parts with machines	3.4	3.0	3.2	3.0

¹³Ibid.

TABLE III

RATINGS RELATIVE TO THE GENERAL AND NON-AGRICULTURAL COMPETENCIES
NEEDED FOR BEST PERFORMANCE ON SERVICE JOBS¹⁴
(Based on a Mean Score of 4.0)

Competencies	Mean Scores Degree Needed
<u>Understanding of</u>	
Company receiving and storing procedures	3.1
Obligation to suppliers of merchandise	3.3
Products handled by company	3.5
Customer problems	3.7
Company-customer relationships	3.8
<u>Ability to</u>	
Aid in formulating company policies	2.9
Display company products advantageously	2.7
Use time widely and efficiently	3.9
Meet and communicate with customers	3.9
Make out and file written reports	2.8
Turn out high quality work rapidly	4.0
Validate freight bills and inventories	3.0
Create a favorable image of employer and business represented	3.6
Maintain a high level of safety in working surroundings	3.8
Locate parts quickly	3.2
Keep records used in service and parts	3.7
Sell farmer on proper use of machines	3.3
Make decisions	4.0

¹⁴Ibid.



Kahler concluded that a dealer can cooperate with agricultural mechanics technical training programs in providing sound work experience programs. These programs provide the much needed on-the-job work experience required for initial employment, and develop a respect for the diverse jobs within the dealership.¹⁵

The technician training program curriculum must emphasize the relationship between training and work, and education and life. Blum states that:

. . . thus the time given us by lessening of the pressure from automation through safety valves can be used to enrich the lives of those affected, if during that period we develop some programs which will make workers and others see the relationship between training and work, and between education and life.¹⁶

Need for Technicians

Mechanization which speeds up the preparation of land, planting, fertilization, cultivation, harvesting, bulk handling, and transportation of crops is one of the major factors in the nation's agricultural productivity. The use of increasingly efficient, complicated, and specialized machines has vastly reduced the human effort required to produce a bale of cotton, bushel of grain, crate of fruit, pound of beef, or gallon of milk.

The number of tractors on farms increased from 3.6 million in 1950 to 5.1 million in 1960.¹⁷ This alone does not indicate the

¹⁵Ibid.

¹⁶Albert A. Blum, "Automation, Education and Unemployment: Some Safety Valves," Phi Delta Kappan, 51(10):557 (June, 1970).

¹⁷Agricultural Engineering Technical Department, State University of New York, "Agricultural Equipment Technology" (Cobleskill, New York: Agricultural and Technical College, 1966). (Mimeographed.)

increased agricultural mechanization, since increased horsepower and size of tractors increased rapidly during that decade also.

As the nation's population continues to grow, agricultural production machinery will play an increasingly important role. It is, therefore, essential to our economy that increasing numbers of people be trained in agricultural mechanics technology for using farm machinery and in its sale and service. Additional technicians are needed to design, develop, manufacture and service agricultural power and equipment units needed on the nation's farms. In 1966, it was estimated that at least 25,000 skilled agricultural mechanics were needed by the manufacturers and distributors of agricultural machinery and equipment.¹⁸

Role Activities of the Agricultural Mechanics Coordinator

It is pointed out by Foecke¹⁹ that the role of an agricultural mechanics coordinator involves an aggregation of several radically different kinds of activities and that the coordinator can be more effective if he is aware of these different activities.

A better understanding of the professional role of the coordinator should (1) be of value to the members of the profession itself, (2) provide a clearer definition of the role and, consequently, better understanding between coordinators in any of the various educational settings where they may be functioning, and (3) yield a better

¹⁸Ibid.

¹⁹Harold A. Foecke, "Effective Teaching and the Educational System," Journal of Engineering Education, 58(2):119-120 (October, 1967).

understanding of what the coordinator's job really is and, consequently, an improved instructional program in agricultural mechanics technician training programs should result. An analysis of the expectations held for this role should aid coordinators in better understanding of professional competency.

The agricultural mechanics technical training program requires that its coordinator be competent in:

1. Selection of learners
2. Choosing the objectives
3. Designing a program of learning experiences
 - a. Determining characteristics of the learners
 - b. Mastering relevant scientific knowledge
 - c. Identifying available resources
 - d. Accounting for applicable boundary conditions
4. Executing the plan
5. Assessing results
6. Comparing the accomplishments with the objectives for purposes of further optimization of the system.

In fulfilling the above program requirements, the function of the coordinator is, among other things, to be able to facilitate and maximize student achievement and assess the achievement of students.

Thus, a question arises which has not been answered and which relates to service personnel skill requirements: will the quantity of agricultural equipment service responsibility be substantially different in coming years, and will this responsibility be met in essentially the same way it is today?

William E. Drake, in a study completed in 1962, stated that off-farm agricultural occupations in 1959-1960 existed in such areas as farm machinery businesses, farm supply stores, slaughtering plants, processing plants, creameries, agricultural insurance, banking, and many other agriculture-related areas. There was little systematic instruction available to assist people in preparing specifically for those occupations.²⁰

Available literature indicates a growth in agricultural mechanics technical training programs during the past decade, but still such growth is inadequate to supply the demand for employees.

The job of the coordinator of agricultural mechanics technical training is unique. The coordinators themselves are required to have completed at least a four-year college training program. Many of the training institutions require an advanced degree. Coordinators usually are members of the institutions' teaching and/or administrative staffs. Thus, they assume the responsibility of providing a systematic program of instruction for agricultural mechanics technician training programs and their purpose is to develop trainees' skills so that they may gain, hold, and advance in related jobs.

Nix lists several characteristics of teachers of vocational agriculture which are relevant to this study:

1. It is a young occupation.
2. It is a profession which seems to be characterized by a diffuse orientation in an age of ever-increasing specialization.

²⁰William E. Drake, "Perceptions of the Vocational Agriculture Teacher's Professional Role in Michigan" (unpublished doctoral dissertation, Michigan State University, East Lansing, 1962), p. 8.

3. The coordinator is caught between various expectations and situations which tend to prevent their fulfillment.²¹

Duties and responsibilities of the coordinator could be listed in the following eight ways:

1. A teacher
2. A student advisor
3. A guidance counselor
4. A supervisor
5. A public relations and contact man
6. An administrator
7. An organizer
8. A good citizen in the community

Nix in his doctoral dissertation pointed out that an occupational group which is striving to maintain or to establish professional status and uniformity of goals will subject its trainees to a relatively long period of training.²² Attempts are made to indoctrinate them in the attitudes and values which are considered by the officials and trainers in the field to be important for the accomplishment of the objectives of the organization, as well as the integration and success of the group as an end in itself.

In the preceding pages of this chapter the teacher has been viewed in his present setting. That setting is characterized by a

²¹Harold Lyle Nix, "A Sociological Analysis of the Roles and Value Orientations of an Occupation" (unpublished doctoral dissertation, Louisiana State University, Baton Rouge, 1960), p. 135.

²²Ibid., p. 139.

rapidly changing agricultural technology and emerging technological change which may well influence the professional role that is expected of the coordinator.

As a member of the broad profession of teaching, the coordinator of agricultural mechanics technician training programs is subject to the role definitional problems that confront all members of the profession. He is subjected to the same frustrations and conflicts that have so often been identified as significant influences on the job satisfaction, general well-being, and resultant effectiveness of all who function as coordinators.

Today's world of work is undergoing unprecedented change. The built-in acceleration factor of technology, i.e., each new development occurs more quickly than the preceding one, is changing the nation's occupational structure at an ever-increasing rate.²³ According to Leighbody,²⁴ Harris,²⁵ and Venn,²⁶ this change has resulted in the virtual elimination of many unskilled and semi-skilled jobs and an increased need for better educated workers at all levels.

The application of science and modern technology has mechanized agricultural production and has created an urgent need for skilled

²³Gerald B. Leighbody, "The Impact of Change on Occupational Education," School Shop, 7:37 (March, 1966).

²⁴Ibid.

²⁵Norman C. Harris, Technical Education in the Junior College: New Programs for New Jobs (Washington, D. C.: American Association of Junior Colleges, 1964), p. 20.

²⁶Grant Venn, Man, Education and Work (Washington, D. C.: American Council on Education, 1964), p. 5.

agricultural mechanics technicians. Training is needed for workers who will develop, market, operate, service, and maintain the sophisticated machinery which is now an integral part of agricultural production.

A need, then, arises for a period of carefully planned, concentrated study and work experience which will enable the student to learn the science, mathematics, basic principles, and technical skills needed for successful entry into this technical field. This may be accomplished within a one to three-year period of time.

Development of Technical Training Programs

Curriculum must be highly efficient. Teaching methods must be streamlined in order to convey maximum information to trainees in a minimum amount of time and to improve their skills and competencies. Laboratory courses must be well-planned, implemented, and coordinated with classroom work so that each laboratory experience yields maximum understanding and improves the skills of the student. Courses of the curriculum can no longer be taught as isolated units, but must be carefully integrated into a smoothly-progressing curriculum, organized and taught by a closely knit staff to insure proper timing of specific subject coverage.

The technician trainee must be capable of working and communicating directly with agricultural equipment specialists and production personnel in his specialized work, of satisfactorily performing work for his employer, and of growing into positions of increasing responsibility. In addition, the graduate agricultural mechanics technician should be an active, well-informed member of society.



The New York study resulted in the following curriculum suggestions:

. . . A curriculum must be carefully designed. Each course must be planned to develop the student's knowledge and skills in that particular area and must be directly integrated into the curriculum. Each course contributes uniquely in the sequence of courses which is specially planned to progress toward the final objective of producing a competent technician. If a close correlation between the courses in the curriculum is not maintained, the curriculum will not provide the depth of understanding required of modern farm mechanics technicians.

The technical content of the curriculum is designed to supply a wide background in the diverse areas of agricultural equipment application. An introduction to the underlying scientific principles and specific study of equipment of different kinds is presented in the first year. The second year of study builds directly on this background, adds a summer's work experience in the field, and introduces additional material from many subject areas such as harvesting equipment, tractor transmissions and final drives, hydraulic equipment applications, farm power and power units, principles of farm mechanization. Agricultural equipment marketing, service, operation, maintenance and adaptation is stressed because this knowledge and related skills and technical capabilities are needed by technicians who work in the agricultural equipment industry as dealers or distributors of farm mechanization machinery. The subject studied and the materials to be learned become more sophisticated in each successive quarter or semester, each taught in greater depth as it builds upon what has been learned before.

Graduates of this curriculum can expect to find employment in many areas of the agricultural production and equipment field. Each area may require somewhat different abilities and different specialized knowledge and skills for a successful career. Most of these differences will be learned by continued study of the job or in part-time study to master the specifics of a special field. . . .²⁷

An important phase of training in many agricultural mechanics technician training programs is the supervised work experience period. During this phase of training, students receive on-the-job instruction

²⁷Agricultural Engineering Technical Department, State University of New York, "Agricultural Equipment Technology" (Cobleskill, New York: Agricultural and Technical College, 1966). (Mimeographed.)



from successful agricultural equipment dealers and experienced dealership personnel.²⁸

Supervised work experience supplements the in-school phase of the program by providing students with learning experiences difficult or impossible to provide in the classroom or laboratory. Supervised work experience provides opportunities for students to develop good attitudes toward work, good work habits, and the ability to function cooperatively with fellow employees. Of equal importance is the opportunity supervised work experience provides students for the development of specific vocational skills in the same environment in which they will later find themselves working. After this supervised work experience training, students return to school with a renewed vigor in the program and its objectives, more demanding of their coordinator, and more diligent in the pursuit of their line of interest.

The expectations of the position, delineation of responsibility, and relationships with administrators remain vague and ill-defined with coordinators of agricultural mechanics. The coordinator is expected to establish purposes, to find ways of being effective, and to justify the program. According to King and Brownell, "Little is known in any systematic way about the wide range of strategies being used by coordinators."²⁹

²⁸Richard H. Bittner, Placement Training Guide (Michigan State University, East Lansing: Agricultural Engineering Department and Institute of Agricultural Technology, 1967), p. 1.

²⁹Arthur R. King, Jr., and John A. Brownell, The Curriculum and the Disciplines of Knowledge (New York: John Wiley & Sons, Inc., 1966), pp. 165-167.

Difficulty in contemporary local program development occurs because such assumptions as those listed previously are only partly true and because they do not stem from a consistent theory of program development.

Many of the present educational programs in agricultural mechanics technician training were derived out of a need that necessitated providing a very basic and simple education as quickly as possible to fulfill this need. Coordinators of agricultural mechanics technician training programs became concerned about the effectiveness of the training programs and have been seeking to develop a more effective program of instruction.

It is no longer sufficient for coordinators to think in terms of being concerned of the present, for that is already history. It is now necessary to become an educator for tomorrow. . . . Each coordinator must use his own expertise as a professional and explore new trails that have recently been blazed or investigate new promising paths.³⁰

Bent and Unrah state that a program in technician training must have the following characteristics:

1. It provides training to develop the abilities, skills, understandings, and attitudes needed by the technical worker.
2. It is of greater value to one preparing for a specific technical trade or engaged in it than it is to others.
3. It is valuable to all those preparing for the same technical occupations.³¹

³⁰A. F. McLean and John J. Hunt, Individualization of Instruction: A Rationale (University of Montana, School of Education, Division of Educational Research and Services, 1970), pp. 1-3.

³¹Rudyard K. Bent and Adolph Unrah, Secondary School Curriculum (Lexington, Mass.: D. C. Heath & Company, 1969), p. 157.

In a United States Department of Health, Education, and Welfare pamphlet entitled Public Vocational Education Programs, a fourth characteristic may be included for technician training programs. This characteristic is that the program should stress skills more than attitudes.³²

Agricultural mechanics technology requires instructional programs which develop a high level of skill and technical knowledge as a prerequisite for entering, as well as satisfactorily completing a post high school specific program of study.

A review of the literature has revealed a need for continual evaluation and change in the agricultural mechanics training programs. Agricultural power units and equipment have become large and complex with the advancement of technology. Training individuals to function in the industry as employees requires an educational program to develop special abilities and knowledge to meet this technological advancement. Because of the shortage of available qualified trained technicians, a need exists for increasing the scope of existing programs and establishing additional ones. Agricultural mechanics employers have certain expectations as to what type of training a well qualified employee should have.

Research indicates that the coordinators of agricultural mechanics technician training programs will perform a variety of activities. Researchers, however, indicate an array of functions as necessary

³²United States Department of Health, Education and Welfare, Office of Education, Public Vocational Education Programs (Washington, D. C.: Government Printing Office, 1960), Pamphlet No. 117, p. 2.

coordinator professional duties. Thus, an awareness has been made of many tasks and concerns that coordinators must possess to adequately meet the expectations of the industry and students.

Although there are tasks and specific role functions to successfully coordinate a training program of agricultural mechanics, this study seeks to establish a priority listing of each selected task of a function as to its importance. Also sought are practices that coordinators feel are pertinent to quality programs.

CHAPTER III

PLANNING AND CONDUCTING THE STUDY

In a study of this nature, specific procedures for planning and conducting the study were used. This chapter will describe the procedures and activities carried out in planning and conducting this study.

The Literature Reviewed

The literature reviewed for planning this study related to curricula, role activities and program requirements for quality agricultural mechanics technical training programs. One objective of the study was to study the methods and procedures used in technician training programs.

Analysis of Curricula

Copies of existing program curricula which were being conducted within the United States were reviewed and analyzed in post high school technician training programs in agricultural mechanics. This list was secured from the Department of Health, Education, and Welfare, Office of Education, Division of Vocational and Technical Education.¹

¹United States Department of Health, Education, and Welfare, Office of Education, "Directory of One-Year and Two-Year Post High School Institutions which Offer Programs of Instruction in Agriculture" (Washington, D. C.: Government Printing Office, 1966), pp. 1-12. (Mimeographed.)

Additional programs which had not been included in this list were secured from those listed by the trade journal of the agricultural mechanics industry.² Information pertaining to curricula in technician training programs was requested by mail from program coordinators of agricultural mechanics technician training institutions.³

Preparing the Questionnaire/Opinionnaire⁴

In preparing the questionnaire/opinionnaire the related literature concerned with the activities and competencies involved in the role of the coordinator of technical training programs was reviewed to formulate a composite list of those activities deemed necessary to the performance of the coordinator's professional duties. A list of role activities and program requirements was extensive; for ease in rating their importance each group was further segregated into major categories.

In identifying and selecting the role activities and operational practices of coordinators as well as curriculum content and development, the study of "Agricultural Equipment Technology"⁵ developed at Cobleskill, New York, and the Placement Training Guide⁶ by Richard H. Bittner

²Where They're Training Mechanics," Implement and Tractor, 82:26-29 (June 21, 1967).

³Appendix C, p. 80.

⁴Appendix F, p. 83.

⁵Agricultural Engineering Technical Department, State University of New York, "Agricultural Equipment Technology" (Cobleskill, New York: Agricultural and Technical College, 1966). (Mimeographed.)

⁶Richard H. Bittner, Placement Training Guide (East Lansing: Michigan State University, Agricultural Engineering Department and Institute of Agricultural Technology, 1967).

at Michigan State University were invaluable in gaining background information in developing the context of this study. Both reports contained comprehensive information as to development of programs and activities coordinators were engaged in.

Items selected for study by the researcher were divided into four parts, as follows:

Part I - Personal Information

Part II - Rating Importance of Role Activities

Area 1 - Teaching

Area 2 - Public relations

Area 3 - Student service

Area 4 - Administration

Part III - Conditions for Quality Programs

1. Supervised work experience

2. Evaluation of supervised work experience

3. Student selection

4. Instructional program

Part IV - Coordinator Educational Concepts

Development of the Rating Scale and Treatment of Role Data

Through consultation with educational researchers and study of research design references, a role importance rating scale was developed. The five-point rating scale for items ten through forty-eight is as follows: 0--no, should not be done; 1--undecided as to whether this should be done; 2--yes, may be done; 3--yes, should be done; 4--yes, must be done. The chi-square⁷ technique was to be utilized to

⁷See Appendix G, p. 90.

determine if the responses by the three groups of coordinators are homogeneous in terms of the rating scale listed above.

If the three groups of coordinators were homogeneous in their responses on the rating scale, the groups were to be combined and a simple mean score would be employed to show the relative importance of each role activity.

Construction of Opinionnaire Pertaining to Program Development

The purpose of the opinionnaire was to determine which suggested plans and practices would be chosen for the organization and conduct of the program and for evaluating the adequacy of their preparation and in-service education for implementing programs in their educational institutions.

Each item was composed of alternatives that might be used in conducting various elements of the agricultural mechanics technical training program. Each alternative was composed so that a respondent would indicate if that alternative would result in an acceptable program.

Five levels of agreement were possible as choices for a response. They were: SA--strongly agree; A--agree; U--undecided; D--disagree, SD--strongly disagree. If the responses of the three groups of coordinators were not significantly different as determined by a chi-square test, the data from all coordinators would be accepted as coming from a single homogeneous population.

The completed instrument was then rechecked in its entirety by consultation with educational researchers.

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Pilot Study

In order to obtain an opinion as to the importance and clarity of the 75 items and their sub-parts on the questionnaire/opinionnaire to be evaluated by the reference group, a pilot study was conducted in the Missoula Technical Center.

1. Seven coordinators of the seven technical programs in the Missoula Technical Center participated. The names of the participants are included in Appendix A, page 77.
2. Each was engaged in planning, teaching, and coordinating his kind of vocational technical education as offered in the Center.

Coordinators were asked to rate, on a five-point scale, the role activities and educational practices followed in the performance of a coordinator's professional duties. They were also asked to list additional items that would be important in a coordinator's performance in any technical training program, and to offer suggestions to improve the items that needed revision.

Conducting the Interviews

A personal interview with each jury member was arranged to obtain his ratings for the importance of role activities. The purpose of the study was explained at that time. The interviews were conducted by the author at the coordinator's office. The accepted principles and detailed procedures used in conducting the interviews are presented in Appendix B, page 78.

The interview with each selected coordinator indicated that the instrument seemed complete and no items were added or deleted. However, the wording of instructions for Parts II and III was changed after the interviews. The coordinators also suggested rearranging ten items in Part III of the instrument, and that the phrase, "Supervised Work Experience" be used rather than "Placement Training," as initially indicated by the researcher. The changes of the items in Part III of the instrument and the use of "Supervised Work Experience" were duly incorporated into the final draft of the instrument which was used in collecting data.

Selecting the Population

Because the study is concerned with the expectations held by coordinators for their professional roles and with the nature of operational practices in agricultural mechanics technician programs, coordinators were categorized into the following three groups:

1. Coordinators of agricultural mechanics technician training programs in four-year colleges and universities.
2. Coordinators of agricultural mechanics technician training programs in community/junior colleges.
3. Coordinators of agricultural mechanics technician training programs in vocational/technical centers.

At the time of the study there were 112 funded agricultural mechanics technician training programs in the United States as listed by the "Directory of One-Year and Two-Year Post High School Institutions

which Offer Programs of Instruction in Agriculture."⁸ On recommendation of the investigator's guidance committee, it was decided to use the total population for this survey, assuming one coordinator per program. Coordinators of agricultural mechanics technician training programs were checked against the 1965-1966 United States Office of Education Directory to eliminate those coordinators who had been less than one year in their present positions.

OBTAINING THE DATA

Coordinator Responses to the Questionnaire/Opinionnaire

Personal, individually typed, cover letters and the printed questionnaire/opinionnaire were sent to a coordinator in each selected educational institution.⁹ Sixty per cent of those questioned responded to the first mailing. A follow-up letter and a second copy of the questionnaire/opinionnaire were sent approximately four weeks after the original mailing.¹⁰ This second mailing was necessary to obtain additional responses. In the original and follow-up mailing, a post-paid, self-addressed, return envelope was enclosed to encourage the respondents to complete and return the questionnaire/opinionnaire.

⁸HEW, Office of Education, "Directory of One-Year and Two-Year Post-High School Institutions," loc. cit.

⁹See Appendix D, copy of first cover letter, p. 81.

¹⁰See Appendix E, copy of second request letter, p. 82.

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Agricultural Mechanics Curriculum Data

Letters¹¹ were sent to those institutions offering post high school agricultural mechanics technician training programs in the United States as listed by the "Directory of Post-High School Institutions which Offer Programs of Instruction in Agriculture,"¹² to secure catalogues of their course offerings. Analysis of courses offered as listed in these institutional catalogues were to be classified into four broad areas as follows:

1. General courses
2. Sales related courses
3. Product related courses
4. Service related courses

The credit hours for the different types of courses in the agricultural mechanics technician training programs were equated to a quarter-hour basis for making comparisons.

¹¹Appendix C, copy of program request letter, p. 80.

¹²HEW, Office of Education, "Directory of One-Year and Two-Year Post-High School Institutions," loc. cit.

CHAPTER IV

COORDINATOR ROLES AND OPERATIONAL PRACTICES RECOMMENDED IN AGRICULTURAL MECHANICS TECHNICAL TRAINING PROGRAMS

The responses of the following groups of coordinators were first analyzed to determine the homogeneity for responses as to the importance of role activities and agreement to suggested practices.

1. Coordinators in colleges/universities
2. Coordinators in community/junior colleges
3. Coordinators in vocational/technical centers

This chapter presents the results of the responses to the importance of role activities of coordinators of agricultural mechanics technician training programs along a five-point continuum scale characterized by the descriptive terms. The points on the scale were: 0--No, should not be done; 1--Undecided as to whether this should be done; 2--Yes, may be done; 3--Yes, should be done; 4--Yes, must be done. Thirty-nine items (Items 10 through 48) were utilized. The opinions by coordinators of agricultural mechanics technician training programs for Items 49 through 84 were recorded on a five-point scale as follows: SA--Strongly agree, A--Agree, U--Uncertain, D--Disagree, SD--Strongly disagree.



RESEARCH OBJECTIVES AND RELEVANT DATA

The specific objectives were: (1) to determine the relative importance of selected role activities of coordinators in agricultural mechanics technical training programs; (2) to determine approved operational practices in technical education programs in agricultural mechanics, and (3) to analyze existing curricula by dividing them into four major divisions.

Significant differences from these analyses among the different groups of coordinators were determined to provide conclusions made pertaining to the homogeneity of the respondents at the .05 level of confidence. The nonparametric chi-square (χ^2) statistic¹ was used as a test of this significance because only frequency data were used. A detailed explanation of the test is presented in Appendix G, page 90.

The .05 per cent level of significance with eight degrees of freedom required a crossbreak analysis using a chi-square test of independence of 15.507² to be significant. Statistical computations revealed that only four of the 102 items treated were significant at the .05 per cent level. It is then assumed that the three groups of coordinators do not differ significantly in their responses to the role activities. Consequently, all responses of coordinators were grouped to determine a weighted mean value. Mean score of the four

¹N. M. Downie and R. M. Heath, Basic Statistical Methods (2nd ed.; New York: Harper and Row, 1965), pp. 160-175.

²Ibid., p. 299.



areas of role activities were used to establish the importance priorities for each area.

To establish the importance of the eleven activities in Area #1, a mean score was calculated as follows: the total responses at each of the five points on the scale were multiplied by the assigned weighting, and the sum of products of the five intervals were divided by the total number of responses (N) carried out to the nearest hundredth. For example, using Item 10, "Develop simulated laboratory instruction," the mean was calculated as follows:³

Scale Variable	No, Should Not be Done 0	Undecided 1	Yes, May be Done 2	Yes, Should be Done 3	Yes, Must be Done 4	Total
Total Coordinator Responses (N = 73)	3	4	9	24	33	
PRODUCT	0	4	18	72	132	226

Coordinator Mean = Sum of Products (226) divided by total responses (73) = 3.10

Means for each item and each role area were computed to provide the means which were used to show the importance of each as a role activity for the coordinator. The role activity means were used to group them according to their importance for their role as perceived by coordinators of agricultural mechanics technical training programs.

³See Appendix J, page 96.

<u>Mean</u>	<u>Role Importance</u>
3.40 and up	Very important or must be done
3.00 to 3.39	Important or should be done
2.00 to 2.99	Optional or may be done
Below 2.00	Questionable

In Table IV, principles of good instruction in the learning process by the use of visual aids and the collection of materials, models and specimens for classroom use are tasks that were deemed very important in the coordinator's role in the teaching function. Activities concerned with facilities and portions of instruction were important, but teaching technical subjects and library work were optional, only to the extent that someone else is doing it in their institution. Limiting the number of students who wish to pursue the technical training of agricultural mechanics was deemed as one of low importance as an activity of the coordinators. It is possible that all qualified applicants are now allowed to enter the program within the allotted number that can be properly trained.

Coordinators gave a high priority to items involving the use of personnel from the industry in program planning and the maintaining of a close working relationship with them, together with seeking program evaluation from recent graduates, as tasks that coordinators must do. Their responses also indicated that strengthening the training program by seeking suggestions and attending in-service training programs must be done as a part of their professional role (see Table V, p. 47).

Coordinator responses to items about holding regularly scheduled advisory board meetings and attending conferences and meetings for self

TABLE IV

RELATIVE IMPORTANCE OF ROLE ACTIVITIES AS THE COORDINATOR'S
RESPONSIBILITY WITHIN THE TEACHING FUNCTION*

Item Number	Role Activity	Mean
<u>Very Important</u>		
13	Use visual aids for instruction	3.58
12	Collect and maintain materials, models and specimens for teaching	3.47
<u>Important</u>		
19	Make individual supervised work experience visits during that period of students' instruction	3.34
15	Develop accepted social conduct among students	3.27
20	Maintain laboratory facilities and equipment	3.26
14	Provide needed instruction in communication skills when teaching	3.18
17	Organize instruction of occupational opportunities in agricultural mechanics technology	3.14
10	Develop simulated laboratory instruction	3.13
<u>Optional</u>		
18	Establish and maintain a departmental library	2.86
16	Teach at least one technical course of the curriculum	2.76
<u>Questionable</u>		
11	Limit enrollment of students expecting to pursue agricultural mechanics	1.91

*See definition 9, p. 9.



TABLE V

RELATIVE IMPORTANCE OF ROLE ACTIVITIES AS THE COORDINATOR'S
RESPONSIBILITY WITHIN THE PUBLIC RELATIONS FUNCTION

Item Number	Role Activity	Mean
<u>Very Important</u>		
32	Seek suggestions to improve the training program	3.75
28	Maintain a close working relationship with the industry	3.68
30	Confer with program graduates to determine program strengths and weaknesses	3.56
21	Involve industry personnel in selecting areas of study	3.52
22	Attend in-service training programs	3.43
<u>Important</u>		
29	Select supervised work experience training stations for students' supervised work experiences	3.38
27	Read current articles in professional/industry journals and publications	3.37
23	Regular meetings are held by an advisory board committee	3.28
31	Provide news articles concerning developments in technological training in agricultural mechanics	3.09
24	Attend regional/national, industry/education conferences and meetings	3.09
<u>Optional</u>		
26	Establish membership in professional organizations	2.92
25	Participate in agricultural equipment dealer meetings	2.91



improvement indicated these activities should be a part of their role. They also responded in a similar manner to keeping abreast of current literature and periodically providing program trends as news items for publication. Coordinators felt that participating in dealership meetings and establishing membership in professional organizations were optional as activities that they might perform.

In Table VI, p. 49, keeping student records current and the development of curriculum for the training program by being aware of students' academic problems were tasks that coordinators felt must be done as a part of their professional activities for student services. Aiding other staff members in securing student information through periodic examination of their cumulative files and a three-year follow-up study on graduates of the program were considered to be important tasks. Conferring with guidance counselors and doing a one-year follow-up study on program graduates were deemed as being almost equally important. Coordinator responses indicated that their involvement in a student organization should be done as a part of their professional role.

Coordinators rated the activities in administration lowest of the four areas of Part II of the questionnaire/opinionnaire. None of the activities in administration were rated as very important or must be done (see Table VII, p. 50).

The coordinators indicated that in-service meetings for the teaching personnel and other departments concerned with the agricultural mechanics technical training program are important and they should assume responsibilities for organizing them. Those activities

TABLE VI
RELATIVE IMPORTANCE OF ROLE ACTIVITIES AS THE COORDINATOR'S
RESPONSIBILITY WITHIN THE STUDENT SERVICES FUNCTION

Item Number	Role Activity	Mean
<u>Very Important</u>		
35	Develop curriculum for the training program	3.58
37	Confer with individual students about their academic problems	3.52
34	Develop and maintain student records	3.51
<u>Important</u>		
40	Assist staff members in gathering and recording information on students	3.24
35	Recruit and select students for training	3.18
38	Consult regularly the cumulative records of students	3.09
42	Conduct a three-year follow-up program of students who have completed the training program	3.00
<u>Optional</u>		
39	Confer regularly with guidance counselors	2.94
41	Conduct a one-year follow-up program of students who have completed the training program	2.80
33	Promote and advise student organizations	2.65



TABLE VII

RELATIVE IMPORTANCE OF ROLE ACTIVITIES AS THE COORDINATOR'S
RESPONSIBILITY WITHIN THE ADMINISTRATION FUNCTION

Item Number	Role Activity	Mean
<u>Important</u>		
45	Coordinate meetings and workshops for faculty involved in the total agricultural mechanics program	3.28
43	Recruit prospective staff members	3.22
44	Call specialists available to assist in instruction	3.15
48	Coordinate liaison work between departments for the students training in agricultural mechanics	3.11
<u>Optional</u>		
46	Solicit funding through various agencies	2.49
47	Develop and administer a student scholarship fund and student loan activity	2.37



which would involve program funds or student funds were not considered important activities by the respondents, and were classified as optional.

Respondents were hesitant to assume leadership when tasks involving departments, staff members and recruiting prospective staff members become a part of their role activities. They expressed that such involvement was important however, and should be a part of their role. Tasks pertaining to money matters, soliciting funds, the administration of scholarship funds and student loans were specifically cited as administrative activities that were optional.

The role activities that coordinators of technician training agricultural mechanics programs believe they are expected to perform were divided into four roles.

GENERAL AREAS OF WORK BY COORDINATORS

Items one through nine of the questionnaire/opinionnaire were developed to gather personal information from the sample population. Each of the nine items was charted by the total responses in tabular form for analysis. They are reported without any sophisticated statistical treatment. However, one may be able to see the number who carried out the activities in different types of institutions and the portion of coordinators conducting each type of work.

The general work areas performed by the coordinators which are used as role definers in this study are listed in Table VIII, p. 52. Seven types of work activities that should be done by the respondents

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TABLE VIII

ACTUAL WORK PERFORMED IN AGRICULTURAL MECHANICS
TECHNICAL TRAINING PROGRAMS BY COORDINATORS

Areas of Work	Coordinators College/ University N = 11 Responses	Coordinators Community/ Junior N = 39 Responses	Coordinators Vocational/ Technical N = 23 Responses	Total Responses N = 73
Direct Programs	7	24	9	40
Teach Technical Subjects	4	20	10	34
Student Placement	4	19	10	33
Develop Curriculum Changes	6	16	11	33
Supervise Teachers	5	9	9	23
Teach Nontechnical Subjects	2	14	5	21
Coordinate Counseling	1	7	5	13



in relationship to their function as coordinators of an agricultural mechanics technician training program were asked.

More coordinators directed the training program than any other listed job. As educators, teaching technical subjects received less than half of possible responses. Curriculum work and student placement were shared with coordinators by the administrative staff, but it was not a common experience. Coordinators from vocational/technical institutes were more concerned about the curricular changes than the other two groups.

Teaching non-technical subjects and supervising other instructors in the training program were activities of some respondents, but of lesser importance. However, more coordinators from colleges and universities indicated that one of the functions of their training program was to supervise teachers than was found in either the community/junior colleges or vocational/technical institutes. This indicates that possibly more departments are involved in the training programs at these institutions than at community/junior colleges or vocational/technical centers.

Although coordinating a counseling service for trainees is a vital part of the program, few coordinators were assigned this activity. Involvement in directing programs, teaching, curriculum changes and student placement apparently are work areas more commonly assigned than student guidance.

Responses to the seven parts of the work load showed as much variation within groups as it does between coordinator groups. No one type of work activity was done by all respondents, which indicates that coordinator roles are diverse and no common pattern emerges.

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CONDITIONS PERCEIVED BY COORDINATORS AS BEING
ASSOCIATED WITH QUALITY PROGRAMS

Part III of the questionnaire/opinionnaire was designed to gain a consensus regarding the nature of specific conditions that the sample population would associate with quality agricultural mechanics technical training programs. The areas for analysis were as follows: (1) supervised work experience, (2) evaluation of work experience, (3) student selection, and (4) instructional program.

The respondents were asked to react to each sub-point of an item.⁴ The researcher chose only the condition which coordinators agreed was essential for quality programs. This is figuratively determined by an acceptable positive weighting of the condition (see unshaded portion of Figure 1, p. 55, for the limitations of acceptance).

Supervised Work Experience

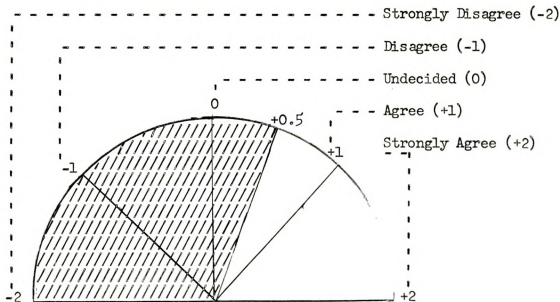
Item #49. Supervised work experience may be offered at:

- a. established farm equipment dealerships
- b. farm equipment manufacturers' retail outlets
- c. equipment repair and service shops

Coordinators chose established farm equipment dealerships for training stations. If they had to find additional stations, their next choice was with equipment repair and service shops. However, coordinators from colleges/universities preferred farm equipment retail outlets as their second choice.

⁴See Appendix H, p. 91.

FIGURE 1
CONDITIONS FOR QUALITY PROGRAMS*



* Mean of 0.5 or above serves as a criterion for items sought for inclusion in a quality program (see Appendix K, p. 97 for mean calculations, and Appendix L, p. 98 for item means).

Item #50. Length of supervised work experience.

- a. 6 weeks or less
- b. 6 to 12 weeks
- c. 3 months
- d. 6 months

Respondents agreed that the length of the students' work experience should be six to twelve months. They were undecided as to lengthening or shortening this period of time, but felt that six months may be too long as a training period.

Item #52. Supervised work experience in the instructional program:

- a. during first year of training
- b. between the first and second year of training
- c. after two years of training.

The supervised training experience should be after the first academic year of instruction and before the second academic year begins. Respondents from community/junior colleges were in agreement with this portion of the training but nearly one-half of them chose at the end of the first year of training as the ideal time. Coordinators were undecided about supervised work experience after two academic years.

Item #53. Barriers to supervised work experience in the present program of instruction are due to:

- a. negative school policy
- b. reluctant dealers
- c. difficult to administer
- d. lack of additional financial support.

Population reaction indicated that there are no barriers to student work experiences. College-university coordinators felt that if there were such an obstacle it would be for the lack of finances.

Item #75. Supervised work experience is an essential part of the technical program.

This item was placed in Part III for the sample population's reaction to support or reject findings in vocational/technical literature pertaining to the importance of work experiences in training

programs. Coordinators agree that this is a vital portion of the training program and give it their support.

Item #76. Simulated laboratory experience is as beneficial as supervised work experience in the technician training program.

Institutional catalogs indicate that there are training programs without supervised work experiences; however, the group of coordinators responded hesitantly. They were undecided as to the educational benefits of a simulated laboratory experience when comparing it to those derived from a supervised work experience.

Evaluation of Supervised Work Experience

Eight items of Part III of the questionnaire/opinionnaire pertained to the evaluation of the students' supervised work experience. Opinions were obtained for the trainee's progress during the time he was involved in this portion of the program. Following are the items and an analysis of the group's reactions.

Item #63. Organizes a conference with employer and trainee to formulate the experience program.

Respondents felt that a conference is a condition associated with a quality program. They were in agreement that such a meeting is beneficial and should be incorporated as an activity prior to the trainee's actual work experience at the dealership.

Item #64. Provides evaluation forms for reporting trainee's progress.



Although no prior item pertaining to the development of forms for use in various phases of the program was asked, the reference group responded that evaluation is a function essential to a quality program.

Item #65. Observes and confers with trainee at work.

Visitations to the place of work for the purpose of personally seeing the student perform and critiquing the trainee's performance is an important task of coordinators.

Item #66. Confers with employers.

Employers are an integral part of the training staff in aiding the student to learn tasks and to perform them with skill. The reference group strongly agreed this is vital for quality instruction and evaluation.

Item #67. Arranges a review session with trainee and employer.

Evaluation requires continuous progress reports to become aware of the trainee's strengths and weaknesses. By coordinator response, this function was found to be vital to the work experience portion of the program.

Item #68. Observes employer training trainee in a new phase of work.

Although the sample population agreed that this activity is pertinent to the program, there were varied responses. Almost one-fourth of the community/junior college group were undecided in their reaction. It appears that some coordinators may wish to absent themselves from the training station when new tasks are being attempted by the trainee and supervised by the employer.

Item #69. Observes trainee at work at regular intervals.

The item does not suggest the number of coordinator observations nor the time between them. Respondents agreed that it is a function that should be maintained as a condition to quality programs.

Item #70. Conducts a final evaluation.

Final evaluation is difficult and is a value judgment, much of which pertains to the affective domain. Throughout the total formal educational process, each student learns to accept evaluations and he is conditioned to expect them. Coordinators agreed that a final evaluation is an activity that they should perform.

Almost all the responses from the population agreed that conferring with employers and observing the student at work were essential. They felt that staging a conference between employer and trainee concerning the work experience portion of the program with subsequent review sessions, including themselves, were valuable. Providing progress reports, aiding the employer in establishing new phases of work, visiting the training site with regularity and recording a final evaluation of the trainee's supervised work experience are conditions associated with quality programs.

Student Selection

Student matriculation is a concern of most post high school educational program directors. It was deemed necessary to formulate items that would reveal the concerns of the respondents for this study. Two items were selected to depict responses.

Item #55. Student selection should be made by:

- a. the coordinator
- b. a faculty committee
- c. a special selection committee
- d. test scores.

Coordinators felt that selection should be made by a faculty committee but the group from vocational/technical institutes tended to want to do the selection themselves. Factors other than test scores should be utilized in student selection. There was indecision among them in reference to special selection committees. It appears that an added special committee for a specific purpose would be just another administrative task that is deemed nonessential.

Item #56. The better student should have:

- a. a farm background
- b. high school vocational training
- c. some previous work experience
- d. mechanical ability

Responses to factors of student success as listed in the item were all very important to the reference groups. Mechanical ability was of more importance than the others; however, the college/university coordinators suggested that previous work experience was almost equally important. All felt that vocational training in high school to those students with an agricultural background are important factors to successfully complete a technical program in agricultural mechanics.

Instructional Program

Eliciting reactions to program changes and added help in program direction was needed for the purpose of evading an entrapment of program status-quo.

- Item #57. The program of instruction for technician training at this institution is:
- a. easily changed by coordinator
 - b. slow to change due to institutional policy
 - c. changed only by school regulations and policy
 - d. regulated by a set structure of funding agencies.

Programs of instruction can be changed by the coordinators with relative ease at all types of institutions. The group also indicated that institutional regulations and policies as well as funding agencies were not barriers to program change for providing the best possible programs of instruction.

- Item #58. Training program direction should include more from:
- a. state level educators
 - b. national level educators

Most responses to this item indicate that any recommended changes in the program need not come from state or national level educators. Several respondents agreed that they would like some direction from the state departments but disagreed with the idea of direction from the federal office.

In seeking answers to conditions associated with providing quality programs, twelve items in Part III were omitted. The responses

were listed as opinion rather than as role activities of coordinators in placement of students. Consequently, the responses that could be checked were inappropriate for analysis. No analysis of data for the variables is included in this chapter or subsequent final summaries.

COORDINATOR EDUCATIONAL CONCEPTS

The reference group's background in education and experience along with their felt need for further self improvement is considered important to this study.

Item #81. "In-service training" programs should be offered.

The respondents were in agreement that such programs were needed and would be beneficial to them in carrying out their professional tasks. Although the coordinators are well educated, as Table IX indicates, in-service training would strengthen their abilities for conducting training programs.

TABLE IX

PROFESSIONAL DEGREES HELD BY RESPONDENTS

Degree	Coordinators College/university N = 11	Coordinators Community/junior college N = 39	Coordinators Vo/tech institute N = 23
None	0	0	5
Associate	0	1	1
Bachelors	0	6	5
Masters	5	30	12
Doctors	6	2	0



Item #82. Special coordinator training program leading to a master's degree or higher.

There seemed to be some indecision in the minds of the respondents regarding the need for a special coordinator training program in a college or university that would lead to a master's degree or higher. Table X reveals that most coordinators have been at their respective institution for less than ten years. As they see a need for program expansion and additional new ones, they realize that training new coordinators and possible degree advancement would add quality educational skills for their roles as coordinators.

TABLE X
YEARS AS COORDINATOR IN PRESENT EDUCATIONAL INSTITUTION

Years	Coordinators College/university N = 11	Coordinators Community/junior col. N = 39	Coordinators Vo/tech institute N = 23
None	0	1	0
1 to 4	5	21	15
5 to 9	4	8	5
10 or more	2	9	3

Item #83. Training in industry, including farm dealerships, would be beneficial to a coordinator.

It was agreed by the group that training workshops provided by the industry would be an important part of their preparation or their continuing education. The worth of this form of education was

considered as important as other in-service training programs. Their educational background has mechanics incorporated; only a few have had a concentrated mechanical education background.

TABLE XI
PROFESSIONAL TRAINING OF RESPONDENTS

Type	Coordinators College/university N = 11	Coordinators Community/junior N = 39	Coordinators Vo/tech N = 23
Agricultural Education Graduate	9	27	13
Agricultural Mechanics Graduate	1	7	4
Non-degree - Industry Trained	1	1	7
Other	1	8	5

Item #84. Coordinators need broader background training in:

- a. mathematics
- b. industrial relations
- c. communications

There is a need for further training in all three areas of specialization. Respondents felt a strong need for further work in industrial relations and improved communication skills in their education. Several felt a need for more mathematics but not to the same degree as the other two areas of training. Further communication skills and improved business relationship training could be seen as

an addition to their capabilities since the majority of the coordinators had several years experience of teaching in the technical training program.

TABLE XII
YEARS TEACHING EXPERIENCE IN AGRICULTURAL
MECHANICS TECHNICIAN TRAINING

Years	Coordinators College/university N = 11	Coordinators Community/junior N = 39	Coordinators Vo/tech N = 23
First year	3	5	2
1 to 5 years	3	11	10
6 years or more	5	23	11

CURRICULUM ANALYSIS

Data are presented that compile data listed in institutional catalogs. Quarter hours (one quarter hour equals $2/3$ semester hour, one quarter hour equals 30 clock hours) for the broad categories were found, such as, (1) general, (2) sales related, (3) product related, and (4) service related.

Courses of the training program were grouped as follows:

1. General courses. All areas of study not generally related to the following three categories, but required institutional courses and including unspecified electives, military training, and physical education, are in this category.



2. Sales related courses. This area includes all areas of study related to sales. This includes human relations courses, courses in bookkeeping and accounting, parts management, salesmanship, public speaking, retailing and economics.

3. Product related courses. Product related courses include all areas of study in skills training such as basic engines, electricity, carpentry, agronomy, animal husbandry, and metals courses.

4. Service related courses. All areas of instruction relating to engine overhaul, power and machinery, laboratory courses of repair and maintenance, and all shop and shop management courses are included in this category.

Curriculum offerings in agricultural mechanics technical training programs were obtained by soliciting catalogues from those institutions listed as having an agricultural mechanics technical training program in operation (see Appendix C for letter). Twenty-nine usable catalogues, five from colleges and universities, seventeen from community or junior colleges, and seven from vocational-technical institutes were obtained.

The average quarter course hours and the average percentage of the total instructional program that is within each category shows that general education courses prevail (Table XIII, p. 67). In General Education (see Appendix N, p. 102), the range for colleges/universities was a high of 57 quarter hours, or 52.1 per cent of the program, to a low of 33 quarter hours, or 31.4 per cent of the program. The average for general education was 48.9 quarter hours, or 47.9 per cent of the program. Community colleges and junior colleges ranged from a high of

TABLE XIII
CATEGORICAL AVERAGES OF CURRICULUM ANALYSIS OF THE
THREE INSTITUTIONAL GROUPS BY QUARTER HOURS

Institution	General Education Qtr.Hr. %	Sales- Related Education Qtr.Hr. %	Product- Related Education Qtr.Hr. %	Service- Related Education Qtr.Hr. %	Supervised Work Study Qtr.Hr. %	TOTAL Qtr.Hr.					
Colleges/universities											
N = 5	48.8	47.9	15.6	15.4	18	17.6	16.8	2.4	2.3	102.3	
Community/junior colleges											
N = 17	31.19	30	10.4	10	26.43	25.5	25.3	23.7	11.85	10.8	105.26
Vocational/technical institutes											
N = 7	12.43	13.4	8.39	8.1	41.54	43.5	27.12	30.9	4.57	4.2	94.01
AVERAGE	30.84	30.43	11.48	11.17	28.66	28.89	23.30	23.8	6.27	5.77	100.52

61.5 hours, or 62.1 per cent of the program, to a low of 11 hours or 9.8 per cent of the program. Community/junior colleges averaged 31.19 hours, or 30 per cent of the total program in general education. Vocational/technical institute programs varied from a high of 38 hours or 35.5 per cent to zero hours in the general education category. The average was 12.436 hours, or 13.4 per cent of the program. The average of all institutions reporting was 29.72 quarter hours in general education, or 27.9 per cent of the total program.

In the column, sales-related courses, the average number of quarter hours ranged from 15.6, or 15.4 per cent, in colleges/universities to 8.39, or 8.1 per cent in vocational/technical institutions. Community/junior colleges averaged 10.4 quarter hours, or 10 per cent of the total program in sales-related courses. All reporting institutions averaged 10.81 hours, or 10.5 per cent of the total.

Product-related courses averaged differently by reporting institutions. Vocational/technical institutions reported an average of 41.54 hours, or 43.5 per cent of their programs for the highest range in this category; whereas colleges/universities reported an average of 18.176 hours or 17.6 per cent for the low. Community/junior colleges reported program hours in this category averaged 26.43 hours, or 25.5 per cent.

Service-related courses in community/junior colleges and vocational/technical institutions averaged rather closely with 25.3 hours or 23.7 per cent, and 27.12 hours or 30.9 per cent, respectively. Colleges and universities reported a lower hour average of 17.4, or 16.8 per cent of the program.

Community colleges and junior colleges reported a higher average number of program hours spent in supervised work experience than the other two institutional groups did. They reported an average of 11.85 hours, or 10.8 per cent in this category, while vocational/technical institutions reported an average of 4.57 hours or 4.2 per cent of the total program, and colleges and universities reported an average of only 2.4 hours, or 2.3 per cent.

It should be noted that the average number of quarter hours for program completion is consistent with the three institutional groups: community/junior colleges averaged 105.26 hours of instruction; colleges/universities averaged 102.3 hours, and vocational/technical institutions averaged 94.01 hours.



CHAPTER V

SUMMARY AND CONCLUSIONS

This has been a study to determine the importance of role activities as perceived by coordinators of post high school agricultural mechanics technician training programs conducted at colleges/universities, community/junior colleges, and vocational/technical institutions. The study further sought operational practices for quality programs and analyzed curriculum offerings of the technician training programs from the three types of institutions.

Purpose of the Study

Specific purposes were to:

1. Identify areas of work performed by coordinators related to the training program.
2. Determine role activities that coordinators feel most important to an agricultural mechanics technical training program.
3. Seek approved teaching and organizational practices for quality programs of technician education in agricultural mechanics.
4. Analyze existing curricula from the three different types of institutions offering agricultural mechanics technical training.

Summary of Role Activities

The ten role activities (with a mean greater than 3.40) that were most important and must be a part of the coordinator's professional role are listed in the following table. The activities were

TABLE XIV
MOST IMPORTANT ROLE ACTIVITIES OF COORDINATORS

Item No.		Mean
<u>Teaching</u>		
13	Use visual aids for instruction	3.58
12	Collect and maintain materials, models and specimens for teaching	3.47
<u>Program Evaluation</u>		
32	Seek suggestions to improve the training program	3.75
30	Confer with program graduates to determine program strengths and weaknesses	3.56
<u>Curriculum</u>		
35	Develop curriculum for the training program	3.58
21	Involve industry personnel in selecting areas of study	3.52
<u>Student Services</u>		
37	Confer with individual students about their academic problems	3.52
34	Develop and maintain student records	3.51
<u>Teacher Improvement</u>		
28	Maintain a close working relationship with the industry	3.68
22	Attend in-service training programs	3.43



related to curriculum development, program evaluation, teaching and teacher development. Two others were in the area of counseling and guidance.

Role activities grouped as items pertaining to public relations were rated more important than those in any other group. The items dealing with administration were rated lowest.

Those activities which were solely done by the coordinator and which dealt primarily with teaching and program evaluation rated high in importance. Some activities which are important that someone does have not been rated as important because they are a part of other persons' roles, such as administrators. This is indicated by the respondents who rated administrative activities lowest as a function of coordinators.

It seems that the functions of teaching and program development are primary responsibilities. If the size of the program is small, the coordinator must perform many of the administrative tasks. He must be more versatile and divide his efforts so that he can accomplish those administrative roles as well as those role activities commonly done by coordinators.

Since programs tend to increase in scope as they are successfully developed, role activities in teaching and program development should receive more consideration than those in administration when initially selecting a coordinator. Administrative activities, if important, will likely become the responsibility of the administrative staff when the load of the coordinator is so great that he must concentrate his activities on teaching and program development.

Summary of Conditions for Quality Programs*

Coordinator responses indicated that all programs should have supervised work experience as part of the program; however, several used simulated laboratory experiences as a substitute. Preferably, the experience portion of the program should be conducted at established agricultural equipment dealerships for a period of not less than six weeks nor more than twelve weeks at the conclusion of the first year of academic instruction.

Although coordinators have reservations about most administrative activities, those dealing with coordination of supervised work experience are essential. Evaluation of student performance through conferences with employer and student, and frequent observations of the student at work are necessary in a quality program.

Students selected for the training program should possess a mechanical ability as well as personal qualifications to assure a successful completion. These qualities could be obtained from prior vocational training or work experience. Coordinators with the help of a faculty committee should act in screening and final selection from the applicants.

Instructional programs should not be so structured that they are difficult to change as the program progresses and grows. Coordinators should have the authority to make changes without complicated procedures that many training institutions now employ.

* See Appendix K for mean calculation, p. 97.

To keep coordinators well informed and up-to-date, periodical in-service training should be a joint effort of colleges and universities and the industry, to insure quality programs. Part of the continued educational training should be in areas of industrial relations and communication skills.

Summary of Curricula

Colleges and universities emphasized general courses more than did community/junior colleges and vocational/technical institutions. Sales related courses in each type of institution received the least emphasis.

Implications

The chi-square statistic was used only to determine homogeneity of the three groups of coordinators. It was established that there were no significant differences in responses of the coordinators from the three types of institutions. Differences do exist in role perceptions of coordinators and in their opinions of desired characteristics of conditions for quality programs, but they are found within the group from each type of institution and not between coordinators from different agricultural mechanics technician training institutions. Rather, some degree of difference is desirable and essential to determine the desired organization and characteristics for programs, resulting in innovating changes to serve better the rapidly changing industry. Curricula show differences in structure both institutionally and regionally. It appears that vocational/technical institutions and community/junior colleges may wish to give attention to more general

education as offered in programs in colleges/universities and not include it as a part of technical courses.

Suggestions for Future Studies

Although this study determines the importance of role activities for coordinators of agricultural technician training programs, it did not evaluate the relative importance of major functions independent of individual role activities. It was found that those role activities of coordinators in the area of administration were rated lower by the respondents than those in other areas, and it was concluded that the administrative function may not be important since role activities of coordinators were low in this area. A study to determine the importance of the administrative function as compared to the other functions of educational programs probably would not minimize the importance of administration that this study has.

Perceptions of role activities were sought only from coordinators in the three types of institutions for analysis. A study of the expectations held for the functions of coordinators by other position groups would serve to validate or reject the conclusions drawn for the training of beginning coordinators as found in this study. These position groups could be institutional administrators, students, agricultural equipment dealership owners, and/or representatives of agricultural equipment manufacturers.

Seeking desired conditions likely to insure a quality program in this study was only one approach to the establishment of good practice. Future research might well deal with the testing of recommended

practices and organizations as piloted in a model program to compare the educational outcomes with programs currently in operation.

Apparently there is a portion of the curriculum that may be classified as general knowledge rather than specific technical knowledge of the program. Research is needed to determine to what extent general education courses are essential in a training program and if these courses, when used as a core curriculum in conjunction with other training programs, are as effective as they would be if offered in separate courses.

APPENDICES



APPENDIX A

PANEL OF EXPERTS FOR QUESTIONNAIRE/OPINIONNAIRE VALIDATION

- | | |
|--|--|
| 1. Mr. F. W. Boisvert
120 Mary Avenue
Missoula, Montana 59801 | Coordinator: Electro-mechanical
Technology |
| 2. Mrs. Margaret Gisselberg
1926 River Road
Missoula, Montana 59801 | Coordinator: Business Mid-
Management |
| 3. Mrs. Mary Swarthout
22 Willowbrook Lane
Missoula, Montana 59801 | Coordinator: Data Processing
Technology |
| 4. Mr. R. L. Toomey
Route No. 3
Missoula, Montana 59801 | Coordinator: Communications
Aviation Technology |
| 5. Mrs. Peggy Lake
No. 7 Holiday Lane
Missoula, Montana 59801 | Coordinator: Medical Secretary
Technology |
| 6. Mr. Roy H. Stewart
Post Office Box 563
Bonner, Montana 59823 | Coordinator: Aviation Technology |
| 7. Mrs. Roma M. Krumsick
135 South 5th Street East
Missoula, Montana 59801 | Coordinator: Practical Nursing |

APPENDIX B

INTERVIEW PRINCIPLES AND PROCEDURES

Interview Principles

The interviews were conducted using the following accepted principles as presented by Seilitz, et al.:¹

1. Every effort was made to establish rapport with the interviewees by:
 - a. The interviewer's manner being friendly, courteous, conversational and unbiased.
 - b. The explanation of the study being brief, casual, and positive.
2. The interviewer served fundamentally as a reporter, accepting the interviewee's ratings without showing approval or disapproval. The interviewer showed interest in the interviewee's opinions and did not divulge his own.
3. The interviewer kept the direction of the interview by discouraging irrelevant conversation and endeavoring to keep the interviewee on the study.
4. The interviews were conducted in a uniform manner.
5. No impromptu explanation of activities was given to explain the meaning of a role.

¹Claire Seilitz, et al., Research Methods in Social Relations (Chicago: Holt, Rinehart and Winston, 1963), pp. 574-582.

6. The interviewer responded to interviewee requests by reading the activity slowly with proper emphasis and offering only such explanation as was needed to clarify the meaning of the activity.

7. The instrument with the role activities listed was presented to all interviewees in the same manner. All role activities were rated by each interviewee.

8. All interviewee-suggested changes and deletions were recorded on the instrument by the interviewer.

APPENDIX C

INFORMATION PERTAINING TO TECHNICIAN TRAINING PROGRAMS

MICHIGAN STATE UNIVERSITY EAST LANSING MICHIGAN 48823

=====

Department of Agricultural Engineering

November 22, 1967

Mr. R. S. Swain, Director
Vocational and Technical Education
Wilson County Technical Institute
Wilson, North Carolina

Dear Mr. Swain:

Your Agricultural Mechanics training program has been recommended highly to me for a study of such programs. My interest in your program is related to my present teaching assignment in the Agricultural Mechanics phase of the Institute of Agricultural Technology at Michigan State University. As a part of my doctoral program, I am interested in comparing our program with others, seeking to introduce good practices not currently in ours.

If you have a curriculum outline pertaining to your program, catalog of courses, mimeographed reports concerning the past year's program and other information that can be sent, I would appreciate these at your earliest convenience.

Thanks for your cooperation and I will be happy to send you a brief summary of the findings if you desire it.

Sincerely,

Robert L. Anderson, Assistant Instructor
Agricultural Engineering Department

RLA:cs



APPENDIX D

FIRST REQUEST LETTER

(Copy)

University of Montana
Missoula, Montana 59801
(406) 243-0211

April 24, 1970

Dear Sir:

A study of the role activities of coordinators of farm mechanics programs in the area of Farm Equipment Sales and Services is being conducted through the University of Montana and Michigan State University under the direction of Dr. H. P. Sweany, College of Education, Michigan State University.

All coordinators in this phase of post High School education within the continental United States are being asked to participate briefly in the study. As one of these coordinators, your reactions and ratings of activities on the enclosed check-list is tremendously important to this study. We expect that the results of this study can be used very effectively in improving curriculum and in-service training programs for farm mechanics coordinators.

To insure a valid study we ask you to give prompt consideration and a candid answer to each item. We are not asking you to sign your name, and you can be assured that any identification will be held in strict confidence. You can in no way be embarrassed through disclosure of information.

We wish to thank you for your cooperation in this study, and will send you a summary of the results if you will enclose a self-addressed envelope with the check-list.

Sincerely yours,

Robert L. Anderson
Assistant Professor
Principal Investigator

1900
1901
1902

APPENDIX E

SECOND REQUEST LETTER

(Copy)

University of Montana
Missoula, Montana 59801
(406) 243-0211

SECOND REQUEST

April 24, 1970

Dear Sir:

Recently you received a questionnaire pertaining to a role study of coordinators of Farm Equipment Sales and Services. To date, we have not received your completed questionnaire.

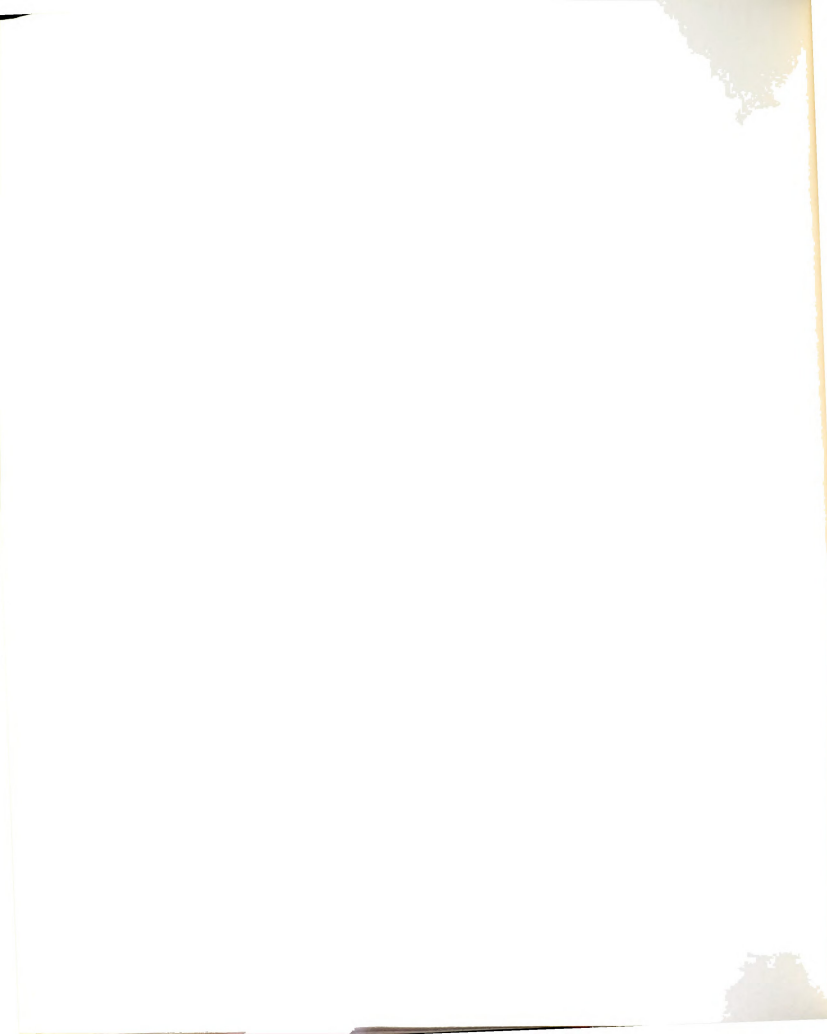
All coordinators in this phase of post High School education within the continental United States are being asked to participate briefly in the study. As one of these coordinators, your reactions and ratings of activities on the enclosed check-list is tremendously important to this study. We expect that the results of this study can be used very effectively in improving curriculum and in-service training programs for farm mechanics coordinators.

To insure a valid study we ask you to give prompt consideration and a candid answer to each item. We are not asking you to sign your name, and you can be assured that any identification will be held in strict confidence. You can in no way be embarrassed through disclosure of information.

We wish to thank you for your cooperation in this study, and will send you a summary of the results if you will enclose a self-addressed envelope with the check-list. If you have already mailed the check-list, please disregard this request.

Sincerely yours,

Robert L. Anderson
Assistant Professor
University of Montana
Principal Investigator



APPENDIX F

QUESTIONNAIRE/OPINIONNAIRE

Part I

Personal Information:

Directions: Please read each question carefully. Select the correct answer and place a check mark (x) in the space provided. Please do not omit any questions.

1. What is your relationship to farm equipment technical education?
(Check all types of work done by you.)
 - ☐ coordinate placement of student in farm equipment business
 - ☐ teach technical classes in farm equipment
 - ☐ direct farm equipment technician education program
 - ☐ teach non-technical courses in farm equipment program
 - ☐ supervise a group of teachers of agricultural technology
 - ☐ coordinate a counseling service
 - ☐ develop curriculum changes as needed
2. Your age?
 - ☐ under 25 years
 - ☐ 25-34 years
 - ☐ 35-44 years
 - ☐ 45 years or older
3. How many years have you been in the present educational institution?
 - ☐ none
 - ☐ 1-4
 - ☐ 5-9
 - ☐ 10 or more
4. How many years have you been in your present position?
 - ☐ none
 - ☐ 1-4
 - ☐ 5-9
 - ☐ 10 or more
5. What is the highest degree that you now hold?
 - ☐ none
 - ☐ Associate
 - ☐ Bachelors
 - ☐ Masters
 - ☐ Doctors
6. What type of initial training qualified you for your present position?
 - ☐ Agricultural Education graduate
 - ☐ Agricultural Mechanics graduate
 - ☐ Non degree--industry trained
 - ☐ Other (please specify)
7. How many years of teaching experience in technical education in agricultural mechanization have you had?
 - ☐ 1st year
 - ☐ 1-5 years
 - ☐ over 5 years
8. How many years (include summer employment) have you been employed in agricultural mechanics work?
 - ☐ none
 - ☐ 1-4 years
 - ☐ 5-9 years
 - ☐ 10 or more years
9. In what type of institution is the farm equipment training program located?
 - ☐ college/university
 - ☐ community/junior college
 - ☐ vocational-technical center/institute

Questionnaire/Opinionnaire Continued, Page 2

Part II

Rating Importance of Role Activities:

Directions: Please review each activity and indicate how important it is for the coordinator of a technician training program in agricultural mechanics for each of the following items:

- 0 No, should not be done
- 1 Undecided as to whether this should be done
- 2 Yes, may be done
- 3 Yes, should be done
- 4 Yes, must be done

Circle a number from 0 through 4 on the scale for each item, thereby indicating the relative importance you attach to each task:

Area #1--Teaching Activities of Coordinators:

- | | | | | | |
|---|---|---|---|---|---|
| 10. Develop simulated laboratory instruction | 0 | 1 | 2 | 3 | 4 |
| 11. Limit enrollment of students expecting to pursue agricultural mechanics | 0 | 1 | 2 | 3 | 4 |
| 12. Collect and maintain materials, models, and specimens for teaching | 0 | 1 | 2 | 3 | 4 |
| 13. Use visual aids for instruction | 0 | 1 | 2 | 3 | 4 |
| 14. Provide needed instruction in communication skills when teaching | 0 | 1 | 2 | 3 | 4 |
| 15. Develop accepted social conduct among students | 0 | 1 | 2 | 3 | 4 |
| 16. Teach at least one technical course of the curriculum | 0 | 1 | 2 | 3 | 4 |
| 17. Organize instruction of occupational opportunities in agricultural mechanics technology | 0 | 1 | 2 | 3 | 4 |
| 18. Establish and maintain a departmental library | 0 | 1 | 2 | 3 | 4 |
| 19. Make individual supervised work experience visits during that period of the student's instruction | 0 | 1 | 2 | 3 | 4 |
| 20. Maintain laboratory facilities and equipment | 0 | 1 | 2 | 3 | 4 |

Area #2--Public Relations:

- | | | | | | |
|---|---|---|---|---|---|
| 21. Involve industry personnel in selecting areas of study | 0 | 1 | 2 | 3 | 4 |
| 22. Attend in-service training programs | 0 | 1 | 2 | 3 | 4 |
| 23. Regular meetings are held by an advisory board/committee | 0 | 1 | 2 | 3 | 4 |
| 24. Attend regional/national, industry/education conferences and meetings | 0 | 1 | 2 | 3 | 4 |
| 25. Participate in farm equipment dealer meetings | 0 | 1 | 2 | 3 | 4 |
| 26. Establish membership in professional organizations | 0 | 1 | 2 | 3 | 4 |



Questionnaire/Opinionnaire Continued, Page 3

- 0 No, should not be done
 1 Undecided as to whether this should be done
 2 Yes, may be done
 3 Yes, should be done
 4 Yes, must be done

- | | | | | | |
|---|---|---|---|---|---|
| 27. Read current articles in professional/industry journals and publications | 0 | 1 | 2 | 3 | 4 |
| 28. Maintain a close working relationship with the industry | 0 | 1 | 2 | 3 | 4 |
| 29. Select supervised work experience training stations for students' supervised work experiences | 0 | 1 | 2 | 3 | 4 |
| 30. Confer with program graduates to determine program strengths and weaknesses | 0 | 1 | 2 | 3 | 4 |
| 31. Provide news articles concerning developments in technological training in agricultural mechanics | 0 | 1 | 2 | 3 | 4 |
| 32. Seek suggestions to improve the training program | 0 | 1 | 2 | 3 | 4 |

Area #3--Student Service Activities:

- | | | | | | |
|--|---|---|---|---|---|
| 33. Promote and advise student organizations | 0 | 1 | 2 | 3 | 4 |
| 34. Develop and maintain student records | 0 | 1 | 2 | 3 | 4 |
| 35. Develop curriculum for the training program | 0 | 1 | 2 | 3 | 4 |
| 36. Recruit and select students for training | 0 | 1 | 2 | 3 | 4 |
| 37. Confer with individual students about their academic problems | 0 | 1 | 2 | 3 | 4 |
| 38. Consult regularly the cumulative records of students | 0 | 1 | 2 | 3 | 4 |
| 39. Confer regularly with guidance counselors | 0 | 1 | 2 | 3 | 4 |
| 40. Assist staff members in gathering and recording information on students | 0 | 1 | 2 | 3 | 4 |
| 41. Conduct a one-year follow-up program of students who have completed the training program | 0 | 1 | 2 | 3 | 4 |
| 42. Conduct a three-year follow-up program of students who have completed the training program | 0 | 1 | 2 | 3 | 4 |

Area #4--Administrative Activities:

- | | | | | | |
|--|---|---|---|---|---|
| 43. Recruit prospective staff members | 0 | 1 | 2 | 3 | 4 |
| 44. Call specialists available to assist in instruction | 0 | 1 | 2 | 3 | 4 |
| 45. Coordinate meetings and workshops for faculty involved in the total agricultural mechanics program | 0 | 1 | 2 | 3 | 4 |
| 46. Solicit funding through various agencies | 0 | 1 | 2 | 3 | 4 |



Questionnaire/Opinionnaire Continued, Page 4

47. Develop and administer a student scholarship fund and student loan activity 0 1 2 3 4
48. Coordinate liaison work between departments for the students' training in agricultural mechanics 0 1 2 3 4

Part III

Programs for Technician Education in Agricultural Mechanics:

Directions: Please read each question or statement carefully. Select your evaluation of each item of each statement and place a check (x) mark in the space provided. Please do not omit any questions or statements.

- _____ (SA) Strongly agree
 _____ (A) Agree
 _____ (U) Uncertain
 _____ (D) Disagree
 _____ (SD) Strongly disagree

Supervised Work Experience Program:

- | | SA | A | U | D | SD |
|--|----|---|---|---|----|
| 49. Supervised work experience may be offered only at: | | | | | |
| a. established farm equipment dealerships | | | | | |
| b. farm equipment manufacturers' retail outlets | | | | | |
| c. equipment repair and service shops | | | | | |
| 50. Length of supervised work experience: | | | | | |
| a. 6 weeks or less | | | | | |
| b. 6-12 weeks | | | | | |
| c. 3 months | | | | | |
| d. 6 months | | | | | |
| 51. Minimum length of total training program: | | | | | |
| a. 6 months | | | | | |
| b. 12 months | | | | | |
| c. 18 months | | | | | |
| d. 2 years | | | | | |
| 52. Supervised work experience in the instructional program: | | | | | |
| a. during the first year of training | | | | | |
| b. between the first and second year of training | | | | | |
| c. after two years of training | | | | | |

Questionnaire/Opinionnaire Continued, Page 5

_____ (SA) Strongly agree
 _____ (A) Agree
 _____ (U) Uncertain
 _____ (D) Disagree
 _____ (SD) Strongly disagree

	<u>SA</u>	<u>A</u>	<u>U</u>	<u>D</u>	<u>SD</u>
53. Barriers to supervised work experience in the present program of instruction are due to:					
a. negative school policy	_____	_____	_____	_____	_____
b. reluctant dealers	_____	_____	_____	_____	_____
c. difficult to administer	_____	_____	_____	_____	_____
d. Lack of additional financial support	_____	_____	_____	_____	_____
54. Laboratory space should be:					
a. 20 square feet/student	_____	_____	_____	_____	_____
b. 30 square feet/ student	_____	_____	_____	_____	_____
c. more than 30 square feet/ student	_____	_____	_____	_____	_____
55. Student selection should be made by:					
a. the coordinator	_____	_____	_____	_____	_____
b. a faculty committee	_____	_____	_____	_____	_____
c. a special selection committee	_____	_____	_____	_____	_____
d. test scores	_____	_____	_____	_____	_____
56. The better students have					
a. a farm background	_____	_____	_____	_____	_____
b. high school vocational training	_____	_____	_____	_____	_____
c. some previous work experience	_____	_____	_____	_____	_____
d. mechanical ability	_____	_____	_____	_____	_____
57. The program of instruction for technician training at this institution is:					
a. easily changed by coordinator	_____	_____	_____	_____	_____
b. slow to change due to institutional policy	_____	_____	_____	_____	_____
c. changed only by school regulations and policy	_____	_____	_____	_____	_____
d. regulated by a set structure of funding agencies	_____	_____	_____	_____	_____
58. Training program direction should include more from the:					
a. state level educators	_____	_____	_____	_____	_____
b. national level educators	_____	_____	_____	_____	_____
59. Establishes training centers	_____	_____	_____	_____	_____
60. Nominates trainees for particular center	_____	_____	_____	_____	_____
61. Provides information to employers for making student selection	_____	_____	_____	_____	_____



Questionnaire/Opinionnaire Continued, Page 6

	<u>SA</u>	<u>A</u>	<u>U</u>	<u>D</u>	<u>SD</u>
62. Notifies trainee of selection by employer	_____	_____	_____	_____	_____
63. Organizes a conference with employer and trainee to formulate the experience program	_____	_____	_____	_____	_____
64. Provides evaluation form for reporting trainee's progress	_____	_____	_____	_____	_____
65. Observes and confers with trainee at work	_____	_____	_____	_____	_____
66. Confers with the employers	_____	_____	_____	_____	_____
67. Arranges a review session with trainee and employer	_____	_____	_____	_____	_____
68. Observes employer training trainee in a new phase of work	_____	_____	_____	_____	_____
69. Observes trainee at work at regular intervals	_____	_____	_____	_____	_____
70. Conducts a final evaluation	_____	_____	_____	_____	_____
71. Develops a recommendation report for placement service	_____	_____	_____	_____	_____
72. Directs the student placement in full-time work	_____	_____	_____	_____	_____
73. Secures names of prospective employers	_____	_____	_____	_____	_____
74. Communicates with prospective employers	_____	_____	_____	_____	_____
75. Supervised work experience is an essential part of the technical training program	_____	_____	_____	_____	_____
76. Simulated laboratory experience is as beneficial as supervised work experience in the technician's training program	_____	_____	_____	_____	_____
77. Management of major manufacturing companies can make essential contributions to training programs	_____	_____	_____	_____	_____
78. Funds for the technical training program are adequate	_____	_____	_____	_____	_____
79. Institutional training facilities are adequate	_____	_____	_____	_____	_____
80. If there is no supervised work experience present in a program of instruction, should it be included?	_____	_____	_____	_____	_____



Questionnaire/Opinionnaire Continued, Page 7

<u>SA</u>	<u>A</u>	<u>U</u>	<u>D</u>	<u>SD</u>
-----------	----------	----------	----------	-----------

Part IV

Coordinator Preparation:

- | | | | | | |
|---|-------|-------|-------|-------|-------|
| 81. "In-service training" programs should be offered | _____ | _____ | _____ | _____ | _____ |
| 82. Special coordinator training program leading to a master's degree or higher | _____ | _____ | _____ | _____ | _____ |
| 83. Training in industry including farm dealerships, would be beneficial to a coordinator | _____ | _____ | _____ | _____ | _____ |
| 84. Coordinators need broader background training in: | | | | | |
| a. mathematics | _____ | _____ | _____ | _____ | _____ |
| b. industrial relations | _____ | _____ | _____ | _____ | _____ |
| c. communications | _____ | _____ | _____ | _____ | _____ |



APPENDIX G

EXPLANATION OF CHI SQUARE TEST STATISTICS¹

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

X^2 = Chi Square

= Summation

O = Observed frequency

E = Expected frequency

df = Degrees of freedom

Note: A fifteen cell Chi Square table for each item of the questionnaire/opinionnaire was constructed for calculation as follows:

	0 No, should not be done	1 Undecided	2 Yes, may be done	3 Yes, should be done	4 Yes, must be done
Coordinators College/Univ.					
Coordinators Commun./junior					
Coordinators Vo./Tech.					

$$\begin{aligned} \text{Degrees of freedom} &= (\text{Rows} - 1) (\text{Columns} - 1) \\ &= (3-1) (5-1) \\ &= (2) (4) \\ &= 8 \end{aligned}$$

$$\text{Significance Level} = 0.05$$

$$\begin{aligned} \text{Rejection Region} \\ \text{Significance} &= 15.507 \end{aligned}$$

¹Downie and Heath, op. cit., p. 299.

APPENDIX H

OBSERVED RESPONSES TO QUESTIONNAIRE/OPINIONNAIRE ITEMS BY COORDINATOR RESPONDENT GROUPS

Item No.	Coords.Vo/Tech(N=23)					Coords.CC/JC(N=39)					Coords.Col/Univ(N=11)				
	0*	1	2	3	4	0	1	2	3	4	0	1	2	3	4
10	1	1	1	9	11	2	3	4	15	16	0	0	4	1	6
11	7	2	7	3	4	14	4	8	10	4	2	1	2	4	2
12	0	1	3	6	13	1	0	3	12	23	0	0	0	4	7
13	1	0	1	7	14	0	0	3	10	26	0	0	1	1	9
14	1	0	1	9	12	1	0	5	18	15	0	0	3	4	3
15	0	0	2	7	14	1	1	7	18	12	0	0	1	5	5
16	2	2	9	4	6	2	1	8	16	12	0	1	1	6	3
17	0	0	3	7	13	0	1	5	23	10	0	0	3	6	2
18	0	0	2	12	9	1	2	8	20	8	1	1	4	2	3
19	0	0	2	9	12	0	0	3	20	16	0	1	2	1	7
20	1	1	2	6	13	2	0	8	5	24	0	0	2	4	5
21	0	1	1	5	16	0	0	0	14	25	0	0	1	5	5
22	0	0	3	7	13	0	0	3	14	22	0	0	2	3	6
23	0	0	2	6	15	0	0	1	20	18	0	2	1	4	4
24	0	0	6	11	6	0	0	6	24	9	0	0	1	7	3
25	0	3	3	11	6	0	2	8	23	6	0	1	1	6	3
26	0	0	2	10	11	0	1	12	18	8	1	0	3	6	1
27	0	0	0	9	14	0	0	4	19	16	0	0	2	5	4
28	0	0	0	5	18	0	0	0	11	28	0	1	0	2	8
29	0	1	2	7	13	0	2	3	16	19	0	0	2	3	6
30	0	0	2	8	13	0	0	2	17	20	0	0	1	1	9
31	0	0	2	13	8	0	0	5	25	9	0	0	3	6	2
32	0	0	0	1	22	0	0	0	17	22	0	0	1	1	9
33	1	1	8	11	2	0	1	12	17	9	0	2	4	2	3
34	0	0	2	5	16	1	0	8	12	18	0	0	0	3	8
35	1	0	1	4	17	0	0	0	15	24	0	0	1	3	7
36	1	1	4	6	11	0	1	5	16	17	0	0	3	3	5
37	0	0	3	6	14	0	0	3	16	20	0	0	0	4	7
38	0	0	7	11	5	0	0	7	22	10	0	0	2	4	5
39	0	1	6	12	4	0	1	8	17	13	0	1	1	7	2
40	0	0	6	12	5	0	1	5	21	12	0	0	2	6	3
41	1	1	2	9	10	1	2	4	18	14	0	0	3	4	4
42	0	2	3	9	9	1	1	8	16	13	0	0	3	6	2
43	0	3	4	0	16	1	1	6	15	16	1	1	0	1	8
44	0	0	6	8	9	1	0	6	18	14	1	0	1	3	6
45	0	1	3	7	12	0	2	1	24	12	0	1	0	4	6
46	4	4	6	5	4	4	7	9	13	6	0	1	1	4	5
47	0	5	4	11	3	3	5	20	10	1	1	0	4	4	2
48	0	1	4	9	9	1	0	6	22	10	0	0	2	5	4

* Scale: 0 No, should not be done
1 Undecided as to whether this should be done
2 Yes, may be done
3 Yes, should be done
4 Yes, must be done

(Continued)

APPENDIX H (Continued)

Item No.	Coords.Vo/Tech(N=23)					Coords.CC/JC(N=39)					Coords.Col/Univ(N=11)				
	SA*	A	U	D	SD	SA	A	U	D	SD	SA	A	U	D	SD
49a	12	6	1	3	1	10	10	4	10	4	6	0	1	4	0
b	1	4	8	4	4	2	16	7	9	4	5	0	1	4	0
c	6	10	3	2	1	6	14	4	11	4	3	2	0	4	1
50a	1	0	2	11	4	2	5	6	11	5	1	1	1	2	4
b	2	4	4	8	1	3	15	7	5	3	4	2	1	1	2
c	7	7	4	2	0	9	14	13	2	1	2	2	2	1	2
d	1	6	2	6	3	2	7	8	7	5	1	1	3	2	0
51a	0	3	1	4	10	2	3	3	8	12	0	1	1	2	5
b	1	6	2	6	3	2	7	8	7	5	1	1	3	2	0
c	4	5	7	2	1	3	14	3	3	4	1	2	3	2	1
d	13	4	2	3	1	17	10	3	0	3	8	1	1	0	0
52a	3	3	6	4	3	7	12	6	4	2	1	3	2	3	1
b	11	8	1	1	0	9	19	4	0	1	7	2	2	0	0
c	2	2	3	5	7	2	8	5	7	6	2	0	2	3	2
53a	0	3	4	7	7	0	6	6	14	7	1	0	2	6	1
b	0	6	3	10	4	0	5	6	14	1	0	1	2	6	1
c	0	8	3	7	3	3	9	6	8	6	2	4	1	1	1
d	3	4	3	6	5	4	11	4	9	5	5	2	1	0	2
54a	1	1	5	5	8	0	3	7	9	10	1	1	4	1	2
b	0	5	5	5	3	4	7	8	7	4	2	0	5	2	1
c	12	4	5	0	0	14	8	6	5	1	5	4	2	0	0
55a	7	8	2	3	1	6	13	7	5	3	3	1	2	3	0
b	4	6	7	4	0	3	16	7	4	0	3	4	1	2	0
c	1	6	8	4	0	6	12	8	6	0	3	2	3	1	1
d	1	7	4	3	5	3	5	5	12	6	1	2	3	1	1
56a	9	10	2	0	0	12	15	5	4	0	4	1	2	2	0
b	5	13	2	0	0	6	23	2	4	0	2	3	3	1	0
c	6	11	2	2	0	7	19	4	1	0	5	4	1	0	0
d	9	13	1	0	0	18	17	3	0	0	7	3	0	0	0
57a	7	7	2	5	1	10	16	3	5	0	4	3	1	2	0
b	0	2	2	12	3	3	7	7	12	4	2	1	1	4	2
c	0	5	3	9	4	1	7	2	18	2	1	2	0	5	1
d	0	3	3	7	6	1	3	1	16	9	0	1	1	3	4
58a	3	8	4	6	0	7	13	7	6	6	2	2	4	2	1
b	0	3	7	10	0	2	4	7	10	10	2	0	4	3	1
59	7	8	6	1	1	5	16	11	1	2	2	4	2	3	0
60	3	9	8	0	3	3	18	10	3	2	4	3	2	2	0
61	9	11	3	0	0	8	20	5	3	1	4	6	1	0	0
62	5	10	3	4	1	5	17	8	6	1	2	5	3	0	1
63	10	9	3	1	0	11	21	3	2	0	4	4	3	0	0
64	11	8	3	0	0	12	20	2	1	0	5	6	0	0	0
65	11	9	3	0	0	13	18	2	2	0	6	4	0	0	0

* Scale: SA Strongly agree
A Agree
U Uncertain
D Disagree
SD Strongly disagree

(Continued)



APPENDIX H (Continued)

Item No.	Coords.Vo/Tech(N=23)					Coords.CC/JC(N=39)					Coords.Col/Univ(N=11)				
	SA	A	U	D	SD	SA	A	U	D	SD	SA	A	U	D	SD
66	12	9	2	0	0	15	19	1	0	0	7	3	0	1	0
67	9	9	4	1	0	12	19	3	1	0	4	5	1	1	0
68	7	12	3	1	0	5	18	10	2	0	4	4	2	1	0
69	8	11	2	1	0	9	22	4	1	0	3	7	0	1	0
70	9	11	2	1	0	11	21	2	0	0	6	4	0	1	0
71	9	12	2	0	0	12	21	1	0	0	3	7	0	0	0
72	4	11	5	2	1	7	16	10	2	0	3	6	2	0	0
73	9	11	2	1	0	13	20	2	0	0	4	7	0	0	0
74	9	12	2	0	0	16	19	0	0	0	6	4	1	0	0
75	12	6	4	1	0	17	14	3	1	0	9	1	1	0	0
76	3	5	5	8	2	7	10	6	10	2	4	2	0	3	2
77	9	13	1	0	0	15	18	1	1	0	6	5	0	0	0
78	2	7	5	6	3	1	11	5	14	4	0	1	1	5	4
79	3	10	3	4	3	1	9	4	17	3	0	4	0	4	3
81	13	9	2	1	0	13	23	1	0	0	8	2	1	0	0
82	6	6	8	1	0	7	18	7	4	1	3	4	2	2	0
83	9	12	2	0	0	12	24	0	0	0	2	9	0	0	0
84a	1	6	6	4	3	2	14	11	7	0	1	5	2	1	1
b	4	14	3	0	1	9	21	5	0	0	5	6	0	0	0
c	6	9	3	2	2	8	16	8	1	0	5	4	1	0	0

APPENDIX I

COMPUTED CHI SQUARE DISTRIBUTION TO RESPONSES OF COORDINATORS

Item Number	Computed χ^2	Item Number	Computed χ^2
10	10.7097	49a	10.4852
11	4.3549	b	17.0821
12	4.9501	c	7.8893
13	4.4019	50a	8.8041
14	5.1460	b	14.8981
15	6.8923	c	10.4404
16	9.3455	51a	3.2939
17	9.6185	b	5.2878
18	11.0847	c	7.9285
19	11.4370	d	9.7616
20	7.1882	52a	5.9700
21	7.2866	b	11.0553
22	1.2557	c	6.8331
23	16.4404	53a	10.0805
24	2.1289	b	4.2442
25	3.4509	c	6.5825
26	15.3461	d	10.8003
27	5.2232	54a	7.9517
28	6.1864	b	7.4290
29	2.4650	c	7.5313
30	4.6340	55a	6.8836
31	3.1981	b	5.6426
32	18.8438	c	10.0854
33	9.9111	d	7.4706
34	6.4493	56a	7.1979
35	7.5913	b	9.0062
36	4.9898	c	4.3676
37	2.8426	d	3.4753
38	3.4678	57a	3.8297
39	4.4140	b	7.9503
40	2.7439	c	5.2299
41	3.9629	d	4.9074
42	5.0468	58a	6.9704
43	20.1330	b	15.3840
44	5.4678	59	10.7521
45	9.3982	60	12.1562
46	8.3019	61	5.6031
47	14.4239	62	4.1734
48	4.9527	63	5.0954

(Continued)

APPENDIX I (Continued)

Item Number	Computed X^2
64	5.1500
65	5.3319
66	9.3395
67	2.5219
68	4.8900
69	2.9621
70	5.7881
71	2.1286
72	3.9532
73	3.3850
74	4.0385
75	6.0616
76	6.4668
77	2.0523
78	8.6427
79	11.8300
80	4.4690
81	10.2396
82	6.4225
83	6.1684
84a	6.7324
b	5.8173
c	8.7793

APPENDIX J

ITEM WEIGHTED MEAN OF COORDINATORS ON QUESTIONNAIRE/OPINIONNAIRE

Item No.	Coordinator Group Average
<u>Area 1--Teaching Activities of Coordinators</u>	
10	3.10
11	1.91
12	3.47
13	3.58
14	3.18
15	3.27
16	2.76
17	3.14
18	2.86
19	3.34
20	3.26
<u>Area 2--Public Relations</u>	
21	3.52
22	3.43
23	3.28
24	3.09
25	2.91
26	2.92
27	3.37
28	3.68
29	3.38
30	3.56
31	3.09
32	3.75
<u>Area 3--Student Service Activities</u>	
33	2.65
34	3.51
35	3.58
36	3.18
37	3.52
38	3.09
39	2.94
40	3.24
41	2.80
42	3.00
<u>Area 4--Administrative Activities</u>	
43	3.22
44	3.15
45	3.28
46	2.49
47	2.37
48	3.11

APPENDIX K

COMPUTATION OF MEAN FOR ITEMS AS CONDITIONS FOR QUALITY PROGRAMS

The group's total responses under each item variable was multiplied by a variable number from +2 to -2. The mean is used as a predictor in rating the various opinion variables (see Appendix H for number of responses). The following is an example:

Item 49--Supervised work experience may be offered only at: a. established farm equipment dealerships b. farm equipment manufacturers' retail outlets c. equipment repair and service shops						
Scale	Strongly Agree (+2)	Agree (+1)	Uncertain (0)	Disagree (-1)	Strongly Disagree (-2)	Product Sum
Variable. . . .						
Vo/Tech Coordin. Responses (N=23)	12	6	1	3	1	
Vo/Tech Product	24	6	0	-3	-2	25
CC/JC Coordin. Responses (N=39)	10	10	4	10	4	
CC/JC Product	20	10	0	-10	-8	12
Col/Univ Coordin. Responses (N=11)	6	0	1	4	0	
Col/Univ Product	12	0	0	-4	0	8

$$\begin{aligned} \text{Total Coordinator Mean} &= \frac{25 + 12 + 8}{73} = .62 \\ \text{Total Responses} &= \end{aligned}$$

Similarly, each part of each opinion item was statistically treated for completing the analysis as to the item's importance. The mean is equal to the sum of the multiplied variable to the number of responses for each modal group divided by the total responses.



APPENDIX L

MEAN OF COORDINATOR RESPONSES TO ITEMS IN PARTS III AND IV OF QUESTIONNAIRE/OPINIONNAIRE*

Item No. and Means				
<u>Supervised Work Experience</u>				
49 a -	.62	b -	.04	c - .37
50 a -	.49	b -	.10	c - .66
52 a -	.10	b -	1.10	c - .10
53 a -	.63	b -	.41	c - .07
75	1.33			d - .05
76	.16			
<u>Student Selection</u>				
55 a -	.48	b -	.49	c - .37
56 a -	.96	b -	.82	c - .92
				d - .22
				d - 1.38
<u>Instructional Program</u>				
57 a -	.74	b -	.49	c - .38
58 a -	.26	b -	.41	d - .75
<u>Evaluation of Supervised Work Experience</u>				
63	1.11			
64	1.22			
65	1.22			
66	1.34			
67	1.10			
68	.85			
69	1.05			
70	1.18			
<u>Coordinator Educational Concepts</u>				
81	1.38			
82	.70			
83	1.25			
84 a -	.17	b -	1.03	c - .82

* Maximum positive score for any item could be +2.00
Maximum negative score for any item could be -2.00

APPENDIX M

INSTITUTIONS FROM WHICH CURRICULUM DATA WERE COMPILED

Name of Institution

Address

I

Colleges/Universities

- | | |
|--------------------------------------|---|
| 1. University of Delaware | School of Agriculture
Agricultural Experimental Station
and Extension Service
Newark, Delaware |
| 2. University of Nevada | Division of Agricultural Economics
and Education
Reno, Nevada |
| 3. New Mexico State University | Agricultural Institute
P. O. Box 3501
Las Cruces, New Mexico |
| 4. North Carolina State University | Agricultural Institute
Raleigh, North Carolina |
| 5. Eastern Kentucky State University | Department of Agriculture
Richmond, Kentucky |

II

Community/Junior Colleges

- | | |
|--------------------------------------|--|
| 6. Casper College | Agricultural Department
Casper, Wyoming |
| 7. State University of New York | Agricultural and Technical College
Cobleskill, New York |
| 8. North Iowa Area Community College | 220 East State Street
Mason City, Iowa |
| 9. Coalinga College | Agriculture Department
Coalinga, California |
| 10. Big Bend Community College | Highway 17 and Nelson Road
Moses Lake, Washington |



APPENDIX M (Continued)

- | | |
|--|---|
| 11. State University of New York | Agricultural and Technical College
Morrisville, New York |
| 12. Wabash Valley College | 2222 College Drive
Mount Carmel, Illinois |
| 13. Lane Community College | 200 North Monroe Street
Eugene, Oregon |
| 14. State University of New York | Agricultural and Technical
Institute
Alfred, New York |
| 15. Trinidad State Junior College | Trinidad, Colorado |
| 16. Danville Junior College | 2000 East Main Street
Danville, Illinois |
| 17. Dodge City Community Junior
College | Division of Vocational-Technical
Education
1002 Second Avenue
Dodge City, Kansas |
| 18. Canton Community College | 102 East Elm Street
Canton, Illinois |
| 19. Lake Land College | Junior College District No. 517
1921 Richmond
Mattoon, Illinois |
| 20. Sauk Valley College | R.R. 1
Dixon, Illinois |
| 21. Iowa Western Community College | 321 16th Avenue
Council Bluffs, Iowa |
| 22. Treasure Valley Community College | 650 College Boulevard
Ontario, Oregon |

III

Vocational/Technical Institutes

- | | |
|---|--|
| 23. University of Minnesota
Technical Institute | Institute of Agriculture
Northwest School and Experiment
Station
Crookston, Minnesota |
| 24. University of Nebraska
School of Technical Agriculture | Curtis, Nebraska |

APPENDIX M (Continued)

- | | |
|---|---|
| 25. Hawkeye Institute of Technology | 106 East 9th Street
Waterloo, Iowa |
| 26. Area One Vocational School
District | 142 Main Street
Calmer, Iowa |
| 27. Delta Vocational-Technical School | P. O. Box 279
Highway 63 West
Marked Tree, Arkansas |
| 28. Wilson County Technical Institute | 902 Herring Avenue
Wilson, North Carolina |
| 29. Canby Area Vocational-Technical
School | Canby, Minnesota |

APPENDIX N

CURRICULUM ANALYSIS OF AGRICULTURAL MECHANICS TECHNOLOGY TRAINING PROGRAMS

College No.	General		Sales Related		Product Related		Service Related		Supervised Work		Total
	Qtr.Hr.	%	Qtr.Hr.	%	Qtr.Hr.	%	Qtr.Hr.	%	Experience	Qtr.Hr.	
Colleges and Universities (N = 5)											
1	52.5	51.5	18	17.6	12	11.8	19.5	19.1	0		102
2	52.5	53.0	10.5	10.6	21	21.2	12	12.1	3		99
3	33	31.4	16.5	15.7	30	28.6	16.5	15.7	9		105
4	49.5	51.6	22.5	23.4	12	12.5	12	12.5	0		96
5	57	52.1	10.5	9.6	15	13.6	27	24.7	0		109.5
Average	48.9	47.9	15.6	15.4	18	17.6	17.4	16.8	2.4		102.3
Community College/Junior College (N = 17)											
6	15	14.5	15	14.5	45	43.5	28.5	27.5	-		103.5
7	46.5	47.0	9	9.1	21	21.2	22.5	22.7	-		99
8	28.5	11.3	9	7.0	37.5	29.4	45	35.3	7.5		127.5
9	43.5	47.6	9	9.8	19.5	21.3	10.5	11.5	9		91.5
10	22	22.7	6	6.2	32	33.0	37	38.1	-		97
11	61.5	62.1	16.5	16.7	7.5	7.6	13.5	13.6	-		99
12	17	15.0	4	3.5	28	24.8	28	24.8	36		113
13	11	9.8	6	5.4	51	4.55	34	30.4	10		112
14	50	49.0	19	18.6	25	24.5	8	7.9	-		102
15	35	29.4	9	7.6	15	12.6	51	42.8	9		119
16	19.5	21.7	15	16.7	25.5	28.3	21	23.3	9		90
17	37.5	35.2	15	14.0	27	25.4	18	16.9	9		106.5
18	21	19.7	6	5.6	30	28.2	21	19.7	28.5		106.5
19	21	21.6	10	10.3	16	16.6	24	24.8	26		97
20	37.5	34.7	10.5	9.7	10.5	9.7	19.5	18.1	30		108
21	22.7	16.6	9	6.6	58.7	42.9	19	13.9	27.5		137

(Continued)

(Continued)

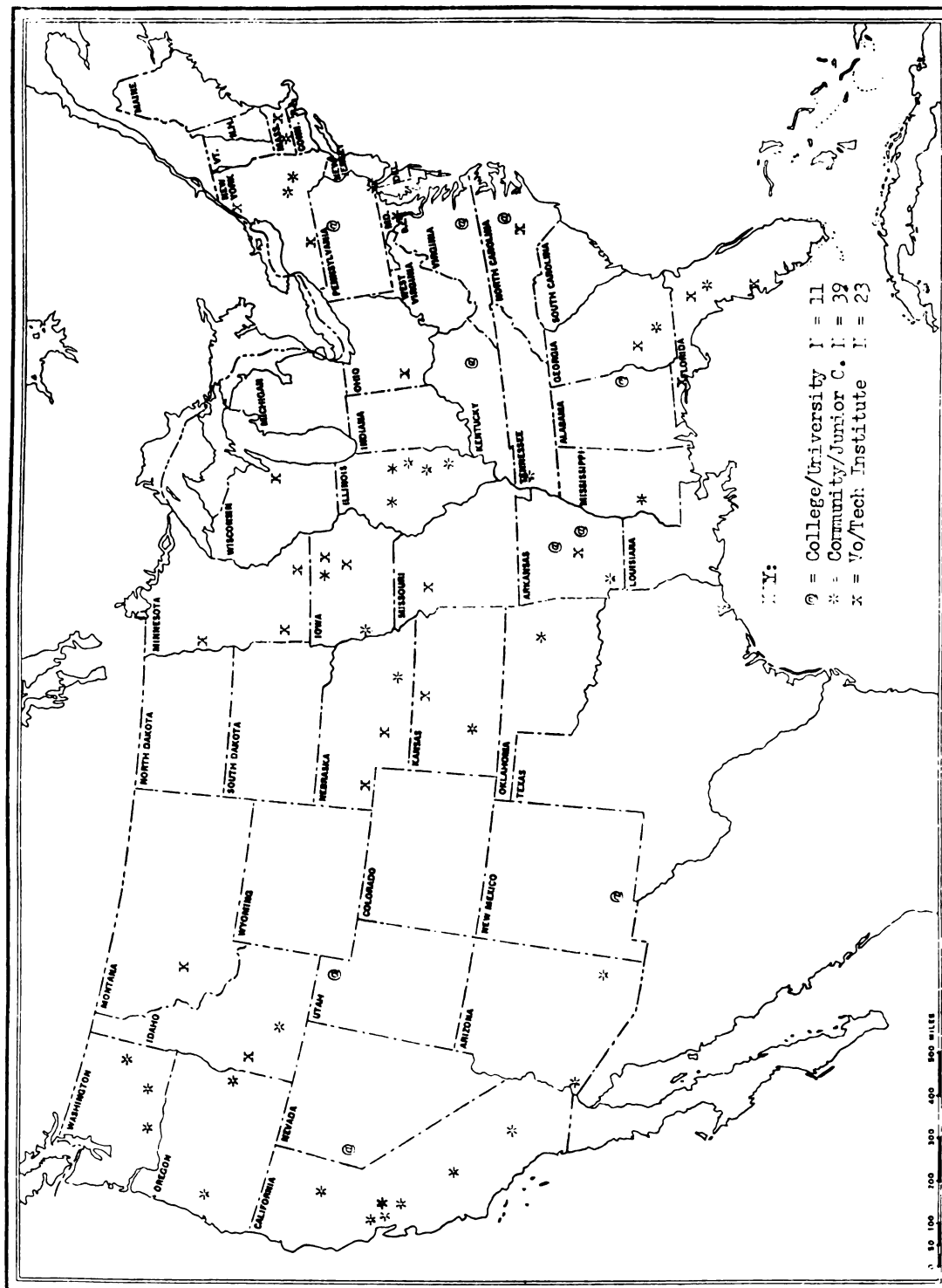
APPENDIX N (Continued)

College No.	General		Sales		Product		Service		Supervised		Total
	Qtr.Hr.	%	Qtr.Hr.	%	Qtr.Hr.	%	Qtr.Hr.	%	Work	Experience	Qtr.Hr.
22	41	41.8	9	9.2	18	18.4	30	30.6	-	-	98
Average	31.9	30.0	10.4	10.0	26.43	25.5	25.3	23.7	11.85	-	105.26
Vocational/Technical Institutes (N = 7)											
23	29	30.2	23	24.0	24	25.0	20	20.8	-	-	96
24	0	0	0	0	41.45	41.9	41.45	41.9	16	16	98.9
25	3.25	3.0	6	5.6	71.75	66.4	27	25.0	-	-	108
26	10.8	20.0	1.2	2.2	19.6	36.3	22.4	41.5	-	-	54
27	0	0	0	0	35	49.6	35.5	50.4	-	-	70.5
28	38	35.5	15	14.0	42	39.3	12	11.2	-	-	107
Average	12.436	13.4	8.39	8.1	41.54	43.5	27.12	30.9	4.57	-	94.01
Total	29.72	27.9	10.81	10.5	29.24	28.4	24.377	24.4	8.44	-	



APPENDIX O

LOCATION OF RESPONDENTS TO QUESTIONNAIRE/OPINIONNAIRE



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