EMPLOYEE-EMPLOYER ASSESSMENT OF THE EFFECTIVENESS OF AGRICULTURAL MECHANICS TRAINING RECEIVED AT MODESTO JUNIOR COLLEGE

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CHAPTER I

INTRODUCTION

Changes and developments that have come about in California agriculture during the past decade would suggest likely trends in the demand for the production, processing, and distribution of foods and other agricultural commodities. These trends need to be considered when reviewing the role of public education in agriculture. Economic forces, occasioned by increased standard of living and population pressures, have caused most if not all of these trends. The result has been adoption of new techniques and the use of new devices in an attempt to increase productivitiy per worker and to increase the efficiency of production. Some of these changes and developments that will affect educational and vocational preparation of workers who will make up the agricultural manpower force in the immediate future include: (McCorkle and Dean, 1961)

1. There continues to be a decrease in the number of farms.
2. There continues to be fewer and fewer persons engaged in on-the-farm production of food fiber.
3. Industrialization has increased rapidly.
4. Population has increased rapidly, and projections have set U. S. population at 230 million and California population at 23.6 million by 1975.
5. Increase in both farm size and output per acre has been steady.

(This trend will continue in the future.)

6. Large blocks of high-quality land have been converted to a number of non-agricultural uses.
7. Competition for water among agricultural, industrial, and domestic uses has become severe.
8. Business control and management of agricultural firms have made wide-spread movement in integration, both vertical and horizontal.
9. The impact of integration has stimulated the specialization of services in production, processing, and marketing.
10. Labor inputs have declined relative to capital inputs, thus requiring higher caliber labor.
11. Use by management of specialists and technicians is wide-spread and will continue to increase.
12. Capital-labor substitution is expected to continue at an accelerated pace as new and improved machines supplant hand labor.
13. California agricultural production can be expected to maintain the same share of the U. S. crop production as it has in the past, or the rate of increase will be equivalent to the past rate of growth.

These changes and developments bring about demands, upon the manpower force, that are important to those who train agricultural workers. New and different kinds of work require new classes of workers each year. Workers are being required to perform different kinds of work for which they do not have sufficient experience or training. From the various agricultural processes are manpower requirements demanding

workers trained intensively in technologies not heretofore required.

The change in agricultural mechanization is one of the most dramatic trends in California agriculture. As a result, there is an extreme shortage of trained personnel in this area. This rapidly expanding mechanization has placed a great emphasis on training programs which can provide trained technical personnel to operate, sell, adapt, produce, and maintain these production facilities.

The most likely place for programs of this type to develop in California is in the community college. As described by Venn (1967):

> A community college is a locally controlled, public, two year institution of higher education which offers broad, comprehensive programs of instruction for persons of post-high-school age. A community college expands opportunities for education beyond high school by: 1) offering programs in occupational, technical, and semi-professional training for students planning to enter a vocation as well as the first and second year college academic courses for students planning to transfer to four year colleges or universities; 2) adhering to an "Open Door" general admission policy but being selective in those whom it retains, graduates and recommends for placement; 3) responding to the particular educational needs of the community it serves; 4) drawing upon its community's total resources in organizing its instructional programs; 5) enrolling students on a full or part-time basis; and 6) offering day and evening classes and programs of instruction and, if economically feasible, on a year round basis.

If the community college is to accomplish these purposes, then it must be aware of the needs of its community.

> Guidance, placement, and follow-up must become a recognized responsibility of all schools and colleges if education is to achieve its purposes in a technological society. One of the major 'uses' of education is in the world of work. Education not put to use has no value. (Venn, 1967)

Follow-up programs should become an integral part of a training program. Those in charge of the program must be aware of the needs of employers and workers, and in order to stay current they must stay in constant contact with the industry served.

Statement of Problem

In order to evaluate its effectiveness, administrators of a program training students for job entry must have sufficient information available with which to make proper decisions and to effect curriculum change. The point has not been reached where those planning Agricultural Education programs have the data needed for adapting programs to the occupational needs of clientele.

Purpose

The gathering of specific information about job entry preparation from former students of the Agricultural Mechanics Program at Modesto Junior College and their employers is the purpose of this study. It is hoped that this information can be used in giving direction to curriculum development or revision. The intent of this study is not only to make a contribution to agricultural mechanics in general but particularly to the extent that it enhances the effectiveness of Modesto Junior College and its agricultural department in service to its community.

Objectives of Study

The objectives of this study were as follow:

1. To determine opinions of former students and their employers as to the adequacy of training at Modesto Junior College for entry level jobs in agricultural mechanics.
2. To determine if there was a correlation between employers' and former students' opinions.

3. To develop from the data collected possible recommendation for curriculum change.

In order to achieve these objectives, a questionnaire (Development of the questionnaire is discussed in Chapter III.) was mailed to former students and their employers which required responses to the following questions:

For the employer --

1. How important is this skill to his present job?
2. How would you evaluate him on this skill?
3. How does he compare with other entry workers who have had other training?
4. Does the employee need additional training in any of the nine skill areas?

For the former student --

1. How important is this skill for your present job?
2. How would you evaluate yourself on this skill?
3. Where did you learn most about this skill?
4. Do you feel a need for additional training in any of the nine skill areas?

Need for the Study

If we are to stay abreast of this rapid trend toward agricultural mechanization, we must continually evaluate our training programs.

> A good vocational or technical education program will have as many (or more) students doing extension work as are doing preparatory work. This goal has already been achieved in many of the existing programs. Those doing extension work are not necessarily day or degree-credit students, nor is their entry marked by prerequisites other than ability to profit from the instruction, nor is the course length necessarily divided into the traditional quarters or semesters--and this

> flexibility is an important element to their effectiveness. The needs in the semi-professional, technical, and highly skilled occupations are for 1) more people, 2) the right kind of people who are, 3) well trained and 4) well educated; only through education can these ends be accomplished. (Venn, 1967)

The best sources of information at our disposal are our former students and their employers; who else can better tell of the adequacy of training; and who else can give direction for further curricular development for retraining and updating of the extension program? It can be concluded that if programs are to be properly evaluated it becomes necessary to go beyond the students currently enrolled. Evaluation should determine how effectively the student is performing in the industry for which he was trained and to determine retraining needs for them as technology changes.

Limitations as to Population

The population was restricted to the Agricultural Mechanics majors who had been enrolled in the Agricultural Mechanics program at Modesto Junior College from 1965 to 1972 and their employers. The writer believed that at this time a consideration of all majors who take agricultural mechanics would not satisfy the specific needs of the study. A study of all majors other than mechanics will perhaps be conducted separate from this study at another time.

Limitations of Geographical Area

This study was conducted in the Yosemite Junior College District service area, which is located in the Sacramento-San Joaquin Valley of California. There are two colleges in this district: Modesto Junior College and Columbia Junior College.

Research Questions

To achieve the objectives of this study, the following research questions were formulated:

1. How do former students perceive the importance of nine skill areas to the job in which they are now employed?
2. How do employers of former students perceive the importance of the nine skill areas?
3. How do employer and former student perceptions of importance of the nine skill areas to the job compare?
4. How do former students evaluate themselves as to competence in each of the nine skill areas?
5. How to employers of former students evaluate the employee's competence in the nine skill areas?
6. How do employers' and former students' perceptions of competencies in the nine skill areas compare?
7. Do former students perceive a need for further training in any of the nine skill areas?
8. Do employers of former students perceive a need for further training in any of the nine skill areas?
9. How do employers' and formers students' perceptions of further training compare?
10. According to employer responses, what is the order of importance of the nine skill areas?
11. According to former student responses, what is the order of importance of the nine skill areas?
12. According to responses, where do former students perceive they learned the most about each of the nine skill areas?

13. According to responses, how do employers compare former students with other entry level workers who received training other than the Modesto Junior College Agricultural Mechanics Program?

Definition of Terms

To avoid possible misinterpretation, some terms used in this study are defined.

Power Mechanics Skills -- refers to those skills necessary for the operation, maintenance, repair, and major overhaul of tractors and machinery.

Machinery and Construction Skills -- refers to those skills necessary to build and repair machinery and farm buildings. (i.e., welding, electricity, carpentry, etc.)

Job Practical Knowledge -- refers to practical, everyday knowledge of work processes, methods, and procedures.

Job Theoretical Knowledge -- refers to knowledge of basic principles and concepts underlying the practical trade work.

Clerical Skills -- refers to skill at keeping records, making out reports, and other types of routine paper work.

Personnel Relations Skills -- refers to skills at dealing with people, such as customers, co-workers, and other tradespeople.

Mathematical Skills -- refers to the ability to use arithmetic or higher mathematics to solve work problems.

Supervisory or Management Skills -- refers to skill at supervising others and managing operations, e.g., instruction, directing, evaluating, planning, and organizing.

Attitude Toward Work -- refers to such behavior as absenteeism, rule violation, concern for quality work, and cooperation.

Hands on Experience -- refers to activities involving the actual performance of manual job skills under conditions as nearly similar as possible to an actual job setting.

Opinion -- for the purpose of this paper an opinion is an expression of an attitude whether verbal, written, or nonverbal.

Attitude -- an emotional tendency, organized through experience, to react positively or negatively toward a psychological object.

Perception -- is an awareness on the part of the individual of his attitude toward a condition, event, a training activity, or person.

Production Agriculture -- Occupations which involve the actual "on the farm" activities of producing an agricultural product.

Agricultural Mechanics -- "Off the farm" occupations which are involved with the sales, service, construction, repair, or operation of agricultural machinery and related equipment.

Unrelated Occupations -- occupations not related to agriculture or mechanics in any way.

CHAPTER II

REVIEW OF LITERATURE

The review of literature in this study is subdivided into five basic sections as follows:

1. Community College Concept
2. Place of Vocational Education in the Community College
3. Need for Evaluation
4. Followup as a Method for Gathering Information for Evaluation
5. Attitudes and Attitude Measurement

Community College Concept

The basic philosophy of a true community college was best expressed by the Joliet Board of Education:

> The American way of life holds that all human beings are supreme, hence of equal moral worth and are, therefore, entitled to equal opportunities to develop to their fullest capacities. The basic function of public education then should be to provide educational opportunity by teaching whatever needs to be learned to whoever needs to learn it, whenever he needs to learn it. (Joliet Board of Education, 1950)

To make a philosophy operational, an ideal image of the community college must also be stated. Gleaser (1950) expresses one concept of this image when he says:

> A good community college will be honestly, gladly and clearly a community institution. It is in and of the community. The community is used as an extension of the classroom and laboratory. Drawing upon the history, traditions, personnel, problems, assets and liabilities of the community, it declares

> its role and finds this accepted and understood by faculty, administration, students, and the citizenry.

If education in the community college is to be provided at all levels, for all people, of all ages, it must become a joint responsibility between formal education and the employers from businesses and industries of the community.

Place of Vocational Education in the Community College

With the increasing need for workers to be better trained, a community college must offer sufficient vocational education to satisfy the needs of its community. If the community college is to do justice to a community, its goal must be to give every youth and adult a marketable skill. "There is not meaning to life except the meaning man gives his life by unfolding of his powers, by living productively." (Fromm, 1967)

To be employed is necessary for economic well being, but more important it gives an individual a feeling of self worth. A man's feeling of competence and meaning for life are best expressed in work that he does well and that he feels has value. Education can do its part by giving people sufficient guidance and training to enable them to find their place in the work world. Vocational education is the right of every young person and adult; it must be available to all in all kinds of educational settings. Its programs must take into account the mobility of our population and the talents of our students.

> Vocational Education has come to be accepted as that phase of education designed to improve the proficiency of an individual in a specific occupation. It is preparatory for specific employment or supplementary to the work of those already employed in a specific occupation. It is not restricted to

> boys and girls in secondary schools, but is provided for any youth or adult who needs and can profit from vocational education. (Ruley, 1970)

The problems facing vocational education are best summarized by Bush (1968). There are three basic problems to be confronted in occupational education: unemployment, underemployment, and overemployment.

1. Unemployment generally results from a lack of proper attitudes or saleable job entry skills.

2. Underemployment is found when an employee is unable to continue to be promoted and is forced to remain at a job level below his personal aspirations.

3. Overemployment results from an education deficit; that is, the demands of the job are greater than the education or experience of the employee. (U. S. Office of Education, 1968)

The junior college may well be the answer to some of these problems, as discussed by Monroe (1972):

> John Diebold, President of the Diebold Group, Inc., and coiner of the term automation, estimates that in the next thirty years, sixty million Americans in several hundred occupations will find their jobs changing radically (McCalls, 1963, pp. 64-65). Old and new workers alike will need to seek occupational training. The community college can serve them in a most profitable manner. Business and industrial leaders who have come to the support of the community college movement since 1960 expect the community college to produce the middle-level technicians and semi-professional personnel necessary to meet the needs of modern production.

Field (1962) discussed the junior college position further:

> The community college should stress preparation for technical and semi-professional occupations. The analysis of occupational trends shows that the number of workers in these occupations has steadily increased. An examination of these types of positions indicates a growing demand for preparation beyond high school. Increasingly the community colleges are offering organized programs in preparation for these jobs.
>
> There would seem to be little reason to question the conclusion that this type of job preparation is appropriate to the junior college.

The importance of Vocational Technical Education in the junior college is evidenced by a statement by Johnson (1965): "The community college clearly has a role of central importance to play in technical-vocational education."

Reynalds (1969) indicates that this importance may increase: "As the growth of new junior colleges continues unabated, there is every evidence that the curriculum policies established for them give a prominent place to vocational-technical programs."

Need for Evaluation

Faced with the burden of providing people with a saleable skill, vocational education has a more specific problem of determining what skills are necessary and saleable in the community. The following is one approach to vocational education:

> It appears that a realistic approach to occupational education includes at least three components. The first is to begin working with respect to building a favorable image and attitude toward the world of work. The second is a more realistic approach to career planning or providing educational experience which would be highly relevant to the world of work and job requirements and, especially, to provide those relevant educational opportunities for people of all ages and throughout the entire career life pattern. The third concerns the establishment in each community, preferably as a part of the on going education system, a coordinating job placement service providing for planning and efficient job entry for young people and opportunity for upgrading throughout life, a placement service bridging the gap between the educational system and the world of work. After initial placement the school system must continue to provide services whereby the employee can efficiently re-enter and efficiently re-educate himself for upward mobility in a successful career building pattern. (U. S. Office of Education, 1968)

In consideration of this approach or to any other for that matter, it becomes necessary for directors of vocational education programs to be continually gathering data with which to evaluate existing programs

and to build new programs. They must stay in constant contact with former students, current students, and with the industry served. With the information gathered, vocational education can determine what skills are necessary and marketable in the community. In the area of agriculture there has long been a need for information concerning the needs of the industry.

> In spite of the extensive amount of research in agricultural occupations the point has not been reached where those planning agricultural education programs have the data needed for adapting programs to occupational needs of clientele. Variation from one area to another is substantial and continually shifting. (Carpenter, 1970)

The need for information is even more apparent when considering the trend away from on-the-farm employment toward non-farm agricultural occupations. There have been many studies dealing with this increase in the non-farm sector of agriculture. As an example, Horner and others (1968) estimated there were 133,452 currently employed in agricultural occupations in Nebraska. Openings in the next two years were expected to amount to 2,800 in professional and managerial occupations, 6,900 in agricultural supplies and service, 1,167 agricultural mechanics, 7,467 in agricultural resources, 1,400 agricultural laborers, 1,833 in agricultural loan offices, and 100 veterinary assistants.

Similar studies have been conducted of the need for farm tractor and machinery mechanics (Hergenreuter, 1960), agricultural equipment, chemical and nursery business (Penn, 1966), and farm machinery sales and service occupations (Couvillion, 1967). In every instance sited, the entry opportunities have been anticipated because of employee turnover and expansion. As agriculture becomes more technological, the ever-expanding need for people with a background in agricultural mechanics will become more apparent. As stated by the Modesto Junior College

Agriculture Department Advisory Committee (1970):

> The committee is impressed with the tremendous need for agricultural mechanics training. Any person associated with agriculture should have some training in this important area, and the committee recommends that if there is expansion in any area, agricultural mechanics should be considered.

In order that a vocational agricultural mechanics program have sufficient information with which to make decisions concerning development or change of curriculum, it must have a means for gathering that information.

Followup as a Method of Gathering Data

In examining the question of curriculum evaluation, it is not sufficient to test a student to ascertain whether or not he has learned the information.

> Gathering of information with which to make an adequate evaluation is and always will be a major problem facing Vocational Education. One possible method of staying current with industry and also providing a program that will benefit a community is a follow up program. (Vicars, 1972)

When the problem of evaluation is considered, the question is raised as to how to gather information. It is said that a community college is training individuals for community needs. This requires finding out what the community needs are. At the same time the college must find out how well its product is performing in the jobs it says it is training him for. The success that the product is having is an evaluation of the program itself.

> Follow up programs on the results obtained from training can be used to provide feed back to curriculum producers. Teachers should conduct student evaluation and follow up of students employed in the field. Feedback from students as well as follow up records should be used in evaluation. (Division of Vocational Education, 1969)

Attitudes and Attitude Measurement

A survey of the literature available on attitudes indicates that there are many different definitions for the word attitude. Some of the less abstract definitions are considered here.

Oppenheim (1966) states that: "An attitude is a state of readiness, a tendency to act or react in a certain manner when confronted with certain stimuli."

In a discussion of attitudes McNemar (1948) states:

> The common element of most definitions of social attitudes is that such an attitude is a readiness or tendency to act or react in a certain manner. No one has ever seen an attitude. An attitude, however real it is to its possessor, is an abstraction, the existance of which is inferred either from non-verbal overt behavior or verbal and symbolic behavior.

Too often the terms opinion, sentiment, and attitude are treated as synonymous. Thurston (1967) describes an opinion as a verbal expression of an attitude. Even though attitudes are not visible, it has been shown that they do exist. Dawes's (1972) description of attitudes indicates that they can be measured:

> When social psychologists speak of attitude, they are generally speaking about an affect or a preparedness to respond in a certain way toward a social object or phenomenon. Moreover, they would generally agree that attitude involves some evaluative component. That is, affect is for or against, preparedness is to accept or to reject. It follows then that techniques meant to measure attitudes generally require an individual to respond in a positive or negative manner to a social object.
>
> If an emperical relational system exists, and if an investigator is clever enough to discover or invent a numerical representation of this system, then measurement has, in fact, occurred. As our understanding of structure in attitudes increases, our ability to measure it will also; as our ability to measure increase, so will our understanding of this structure.

It is generally accepted that attitudes can be measured, and Good (1954) believes the two most common methods of securing data concerning attitudes are the interview and the questionnaire. He states:

> The questionnaire has been used increasingly, however, to inquire into the opinion and attitudes of a group. The questionnaire is especially useful in descriptive survey instruments in securing information from widely scattered sources and when it is not practical or possible to see the respondents personally!

Summary

One of the community college's responsibilities to its community is to provide the people with education programs through which they can learn or update a saleable skill. Vocational education can best do its part in skill training after a thorough evaluation of what training is necessary. This evaluation can best be made after information is gathered emphasizing what skills the community needs.

To merely teach a program and say that a need is being satisfied is not sufficient. A follow-up of former students is necessary to determine their employability and to gather information with which vocational education can evaluate its program and better provide industry with those employees they need. At the same time information may be gathered which would indicate need for curriculum change or at least indicate areas of retraining.

CHAPTER III

METHODOLOGY

The objective of this study was to ascertain employer and former student opinions on the adequacy of the training received by students of the Modesto Junior College, Agricultural Mechanics Program, at Modesto, California. In order to achieve the stated objective, it was necessary to collect data from a group of former students and employers of those students.

Population -- The population for this study was comprised of all those students who were Agricultural Mechanics majors from 1965 to 1972 in the Modesto Junior College Agricultural Department and those individuals or companies which employed them. There were six subjects for which current addresses could not be found; they were excluded from the population.

Sample -- For the purpose of this study the sample was the total population.

Methodology -- Because of the homogeneous grouping of the population and the distance the writer was from the population, it was decided that a mailed questionnaire would be the most effective method to collect data.

In constructing the questionnaire the following recommendations concerning appearance and effectiveness were considered (Levine, 1958):

1. Questions should be separated by dotted lines or extra spaces distinguished by boldface type, etc., to ensure that the respondent will answer the right question.

2. The type should be varied to emphasize important words, phrases, or instructions.

3. Check lists, fill-ins, or multiple-choice questions should be conveniently arranged. Category designations and space for answers should be placed close together to avoid the possibility of error. Where confusion is possible, a series of dots leading from the category to the answer space is helpful.

4. When the questionnaire is necessarily very long, it should look as short as possible. Through printing, use of both sides of the page, double columns, and reduced size can make the printed questionnaire appear less than one-third its mimeographed size.

The following guides for construction of a questionnaire are a summary of comments made by several students of the field (Suchman, 1940; Parten, 1950; Wallace, 1954; Levine, 1958; Donald, 1960). These guidelines were utilized to insure a systematic presentation:

1. The questions should be stated simply and clearly in words commonly used by the respondents; they must be relevant and meaningful; the categories to be checked should cover the full range of answers the respondent can give to the questions.
2. The position of a question in relation to other questions frequently affects the responses.
3. Questions should be worded so that it will not be easier for respondent to answer one way than another.
4. Whenever possible, a simple and convenient response system should be used.
5. It may be advisable to encourage the respondent to supply additional information not adequately tapped or specified by the questionnaire because adhering to the categories or alternatives

of a rigidly structured questionnaire may prove frustrating to some respondents. A final question may be provided at the end of the questionnaire, or at the end of a specific section, which invites the respondent to discuss any problem that is important to him.

The instrument utilized was an adaptation of one developed by Vicars (1972), who adapted it from a much larger instrument used by the Project Able (1971) study conducted in Quincy, Massachusetts. The instrument utilized the following nine variables, which were identified by the Agricultural Mechanics staff at Modesto Junior College to be representative of the objectives of the Agricultural Mechanics program.

1. Power mechanics skills
2. Machinery and construction skills
3. Related mechanics skills
4. Job practical knowledge
5. Job theoretical knowledge
6. Clerical skills
7. Personal relations skills
8. Mathematical skills
9. Supervisory or management skills

These variables were rated across three, five-point Likert-type scales. The following points were covered for the employer: (1) concerned the importance of the skill to the job; (2) evaluation of the former student on each skill; (3) comparing him on each skill with other entry level workers; and (4) determining whether or not the former student needed additional training in any of the nine skill areas.

For the former student the Likert-type scales involved were as follow: (1) importance of the skill for his job; (2) an evaluation of himself on that particular skill; (3) where the greatest amount of the skill was learned; and (4) did he feel a need for additional training in any of the nine skill areas.

At this stage in their development the questionnaires were reviewed by members of the Modesto Junior College Agriculture staff to determine if they would elicit the desired information. It was the staff's opinion that sufficient information could be gathered by the questionnaires to begin an assessment of the Agricultural Mechanics program.

Throughout the development of the instrument there were consultations with members of the Agricultural Education Department. After completion of the questionnaire it was presented to the research design class (AGED 5980) at Oklahoma State University. This class consisted of Master's and doctoral students who were involved in research studies of their own. It was their opinion that the questionnaire would gather the desired information.

Additional information was solicited from the employee about specific aspects of his training while at Modesto Junior College. This material was not utilized in the study, although it was information which was of importance to the Modesto Junior College Agriculture Department. On each questionnaire an additional open-ended item was included to allow respondents to make any comments they felt were necessary.

Two cover letters were used in transmitting the questionnaires. One was from the Dean of Instruction stressing the importance of this study, and a second, more personal one was from the writer, since

all former students and most of their employers knew him.

> It has been found that a personal touch in the letter of transmittal is quite effective in bringing in returns. A postscript which looks as if it were written by hand or a personal signature of the sender has proved effective. (Parten, 1950)

This cover letter from the writer included instructions to the former student concerning his questionnaire and the employer's questionnaire, which was also sent to him. The student was instructed to hand carry the employer's questionnaire to him. He was further requested to encourage the employer to return it as soon as possible. A copy of the dean's cover letter was attached to the employer's questionnaire. Both questionnaires with self-addressed, stamped envelopes included for their return were sent regular mail.

One of the difficulties in mail questionnaires is the often low percentage of returns. A number of techniques were planned to induce returns. As stated by Donald (1960), however:

> Analysis of response according to the number of stimuli required to induce return of the questionnaire indicates a significant relationship between response elicitation and member involvement. The higher the involvement in terms of active participation, knowledge and understanding of the organization, and loyalty to it, the fewer the stimuli required to induce a response.

It was hoped, therefore, that due to the involvement and understanding most of the former students and their employers have with the Agriculture Mechanics program at Modesto Junior College the returns would be high.

Three weeks after the initial mailing, a follow-up letter was mailed to the non-respondents. The letter tactfully asked them if they had misplaced the questionnaire and reminded them of its importance. A second follow-up letter was mailed ten days later which again stressed

the importance of each response to the validity of the study. Enclosed with the second letter were copies of both questionnaires. To insure that the non-respondents would not bias the study, a double sampling was done two weeks after the second follow-up letter. The double sampling technique provides a method to check on the reliability of the information obtained from the first sample (Van Dalen, 1962). The double sample consisted of 15 individuals, which was approximately 25 percent of the non-respondents. Eleven of these 15 were contacted personally by a member of the Modesto Junior College Agricultural staff. The other four in the double sample could not be located at the time of the interview.

The telephone was used as a means of prodding the non-respondents one last time. One week prior to initiating the interviews of the double sampling, each non-respondent received a telephone call from the Junior College encouraging him to complete and mail the questionnaire. Researchers who have employed the telephone follow-up to increase returns (Berdie, 1954; Donald, 1960; Levine and Gordon, 1958; Suchman and McCandless, 1940) found that a long distance call impressed upon the non-respondents the importance and urgency of their response.

Statistical Procedure

On all data collected, frequency distributions and percentages were established and proved to be the most valuable statistics. Where possible, graphs and tables were utilized to illustrate pertinent statistics.

The population was separated into several groups according to current status of employment. Before they could be placed together and

considered to be one group, it was necessary to determine if there was significant difference between the groups.

In order to determine if a difference existed between the groups of former students when responding to both importance of skill to the job and his self-evaluation on the skill, Kendall's Coefficient of Concordance, W, was used to show correlation of the rank order of the skills perceived by the different groups. This statistic was used because it fit the situation of ranking. Kendall's W was also utilized to determine if a difference existed between respondents and the double sample taken of non-respondents. Finally, Kendall's W was used to determine if a significant degree of correlation existed between former students and employers of former students on the questions of importance of the skills to the job and the evaluation of those skills. The statistic "W" fit in the above-mentioned situations because of the rankings.

In addition to Kendall's W, it was necessary to calculate a chi-square for each Kendall's W to show the significance of the calculated W. The null hypothesis posited by the chi-square is that the groups are not related. The computational formula for Kendall's Coefficient of Concordance, W, is as follows:

$$W = \frac{S}{1/12\ K^2\ (N^3 - N)}$$

where S = sum of square of the observed deviations from the mean of R_j; that is,

$$S = \sum (R_j - \frac{\sum R_j}{N})^2$$

where R_j = sum of ranks by K judges on one of the entities

K = number of sets of rankings; e.g., the number of judges

N = number of entities (objective or individuals) ranked

$1/12\ K^2\ (N^3 - N)$ = maximum possible sum of the squared deviations; i.e., the sum S which would occur with perfect agreement among K rankings

The correction for ties is:

$$T = \frac{\Sigma (t^3 - t)}{12}$$

where t = number of observations in a group tied for a given rank

Σ - directs one to sum over all groups of ties within any one of the K rankings.

In order to test the significance of the statistic W, a chi-square is calculated using the formula:

$$X^2 = K\ (N-1)\ W$$

Procedures for Computing W

These are the steps in the use of W, the Kendall Coefficient of Concordance:

1. Let N = the number of entities to be ranked, and let K = the number of judges assigning ranks. Cast the observed ranks in a K x N table.
2. For each entity, determine R_j, the sum of the ranks assigned to that entity by the K judges.
3. Determine the mean of the R_j. Express each R_j as a deviation from the mean. Square these deviations, and sum the squares to obtain S.
4. If the proportion of ties in the K sets of ranks is larger, use

$$W = \frac{S}{1/12\ K^2\ (N^3-N) - K\sum T}$$

in computing the value of W. Otherwise use:

$$W = \frac{S}{1/12\ K^2\ (N^3-N)}$$

5. The method for determining whether the observed value of W is significantly different from zero depends upon the size of N:
   a. If N is 7 or smaller, table R gives critical values of S associated with W's significance at the .05 and .01 levels.
   b. If N is larger than 7, either formula

$$X^2 = \frac{S}{1/12\ K\ N\ (N+1)} \quad \text{or formula} \quad X^2 = K\ (N-1)\ W$$

   (the latter is easier) may be used to compute a value of X^2 whose significance, for df = N - 1, may be tested by reference to table C. (Siegal, 1956)

Since one group of former students also had employer responses, the Pearson product moment coefficient was used on the importance of the skill to the job and on the evaluation of each skill. The Pearson r was used to determine the correlation of employee and employer perceptions on these two questions for each individual skill. This statistic could not be used on previous correlations since interval data and paired values could not be achieved.

"The Pearson r represents the extent to which the same individual or events occupy the relative position on two variables." (Runyan, 1967) The raw score computational formula according to Popham (1967) is as follows:

$$r = \frac{\Sigma XY - (\Sigma X)\ (\Sigma Y)\ /\ N}{\sqrt{\left\{\Sigma X^2 - (\Sigma X^2/N)\right\}\ \left\{\Sigma Y^2 - (\Sigma Y^2/N)\right\}}}$$

Computational procedures for Pearson r employing the raw score method are as follow:

1. List all X values and corresponding Y values.
2. Count the number of subjects to determine N.
3. Sum all X and Y values.

4. Square all X and Y values.

5. Compute the product of all X and Y paired values.

6. Sum all products of X and Y paired values.

7. Place determined values into formula.

Some assumptions about data must be made if the Pearson r is to be used:

1. That the relationship between variables is linear.

2. That a normal distribution exists.

3. That at least interval data is being used.

In answering the question, do employers and their former students perceive the need of additional training in the same manner, the chi-square technique was chosen because of the binomial population comparison of frequency. Chi-square is employed to test the difference between the employers' and former students' perceptions. The null hypothesis used in this case was: H_o: There is no significant difference in the perceptions of the employers and former students concerning need for additional training in the nine skill areas. Significance level was set at the .05 level for the stated hypothesis. The significant chi-square value obtained from the 2 X 2 cell table, using one degree of freedom, is 3.84. Any chi-square value greater than the table value suggests to the researcher that he should reject the Null Hypothesis. The computational formula for chi-square as given by Popham (1967) is:

$$X^2 = \frac{(\text{Observed Frequencies} - \text{Expected Frequencies})^2}{\text{Expected Frequencies}}$$

Since the 2 X 2 cell table is utilized (instances in which there is but one degree of freedom), the Yates correction for continuity must be employed. The following change in the formula is then necessary:

$$X^2 = \frac{(\text{Observed Frequencies} - \text{Expected Frequencies} - 0.5)^2}{\text{Expected Frequencies}}$$

Once the necessary quantities for the solution of chi-square analysis are available, they are placed in the formula. The chi-square value is then interpreted from a table of probability values. These values when compared to the value at the .05 level of significance will reject or fail to reject the Null Hypothesis.

Two limitations exist in the use of chi-square. In the one degree of freedom situation, the expected frequency should equal or exceed 5 to permit the use of the chi-square test. When the degrees of freedom are greater than 1, the expected frequency in 80 percent of the cells should equal or exceed 5. The second, and most important, restriction is that the frequency counts must be independent of one another. Failure to meet this requirement results in an error which may well lead to the rejection of the Null Hypothesis when it is actually true.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this chapter is to present and analyze the data collected in this study relating to the 13 research questions presented in Chapter I. Three statistical treatments were utilized to evaluate the data--the Kendall's Coefficient of Concordance, W; the Pearson Product Moment Correlation Coefficient, r; and the chi-square test, X^2.

Kendall's "W" was used to determine if a difference existed between several factions of the former student population. It was also utilized to determine if a difference existed between respondents and a randomly selected double sampling of the non-respondents. And, finally, it was utilized to show the amount of agreement between former students and their employers' perceptions of (1) the relative importance of the nine skill areas and (2) their evaluation of former students in the nine skill areas.

The Pearson Product Moment Correlation Coefficient was utilized on 53 matched pairs of students and their employers to determine the level of agreement on each of the nine skill areas as to importance to the job and evaluation of each skill. To analyze the question of the need for further training, the chi-square test was utilized. The chi-square test was also utilized to test the significance of the statistic W, Kendall's Coefficient of Concordance.

A mail questionnaire was developed in two forms, one for the former students of the Agricultural Mechanics program at Modesto Junior College and the second for employers of these former students. The importance of the skills to the job and the need for further training, an evaluation of the student on each skill, and the need for further training were common to both forms. The students were further asked to indicate where they learned the most about each skill. The employers were asked to compare these former students to other entry level workers in reference to the nine skill areas. Additional items were included for use by the Modesto Junior College Agriculture staff. Copies of both questionnaires are included in Appendix B.

An additional open-ended item was included to allow the respondents to expand on responses made earlier in the questionnaire if they desired to do so. As the returns were examined, they provided data regarding the research questions stated in Chapter I. The data will be presented in three sections: first, a description of the population; second, a discussion of the data as it affects the research questions; and third, a summary of selected comments.

Description of Population and Return

The population of this study was comprised of the Agricultural Mechanics majors who had been enrolled in the Agricultural Mechanics program at Modesto Junior College from 1965 through 1972 and their employers. Table I shows the distribution of the population and the returns.

The former student portion of the population consisted of 225 former students of the Agricultural Mechanics program. The relatively

low number of employers is best explained in Table II, where the writer felt it was necessary to separate the former students into distinct groups in order that they could be better described.

Table I shows that 170 (75.6 percent) former students and 59 (72 percent) employers responded prior to the double sampling. After the double sampling of the non-respondents, there were 181 (80.4 percent) former student returns and 63 (76.8 percent) employer returns.

TABLE I

DISTRIBUTION OF POPULATION AND RETURN

	Former Students		Employers	
	No.	%	No.	%
Total N	225		87	
Returns	170	75.6	59	67.8
Non-Respondents	55	24.4	28	32.2
25% Double Sample	15		7	
Return	11	73.3	4	57.1
Total Return	181	80.4	63	72.4

As mentioned earlier, the writer felt it was necessary to group the former students into several categories in order to better describe them. Table II shows the current status of the former students.

TABLE II

CURRENT STATUS OF FORMER STUDENTS

Status	Number	Percent
Employed	87	48.1
Self-Employed	52	28.7
Continuing Education	36	19.8
Military Service	5	2.8
Unable to Tabulate	1	0.6
Total	181	100.0

Analysis of Table II indicates that 87 (48.1 percent) of the former students are employed and 52 (28.7 percent) are self-employed, for a total of 139 (76.8 percent) working. Thirty-six (19.8 percent) former students were continuing their education, while 2.8 percent were in the military service. This 2.8 percent represents five persons. There was one return that could not be tallied because it was incomplete.

A reference was made earlier to the relatively low number of employers, but as one can see only 87 (48.1 percent) had employers; and as indicated in Table I, 63 (72.4 percent) of these did respond.

The writer believed that further analysis of both the employed and the self-employed groups was necessary. Table III shows the employment distribution of former students in these two groups. In analysis of Table III one notes that 41 (29.5 percent) of the former students who were working were involved in production agriculture, with 31 being

self-employed and only 10 employed. It was also noted that 60 (43.2 percent) were involved in off-the-farm Agricultural Mechanics, 43 of whom were employed while only 17 were self-employed. In addition, 24 (17.2 percent) were involved in mechanics not related to agriculture, with only 1 of these being self-employed. Overall, there were 125 (89.9 percent) of the former students involved in production agriculture or in some form of mechanics. This left 14 (10.1 percent) individuals who were in occupations unrelated to agriculture or mechanics; 11 of these were employed, while only 3 were self-employed.

TABLE III

DISTRIBUTION OF EMPLOYMENT OF THE EMPLOYED AND SELF-EMPLOYED GROUPS OF FORMER STUDENTS

	Employed		Self-Employed		Total	
Distribution of Employment	N	%	N	%	N	%
Production Agriculture (On farm or dairy)	10	11.5	31	59.6	41	29.5
Agricultural Mechanics (Off-Farm)	43	49.4	17	32.7	60	43.2
Mechanics Not Related to Agriculture	23	26.4	1	1.9	24	17.2
Unrelated Occupations	11	12.6	3	5.8	14	10.1
Total	87		52		139	

To determine if the groups of former students responded in a similar manner, the writer believed it was necessary to make a comparison of their responses. The Kendall's Coefficient of Concordance, W, was used to see if a difference existed. Table IV shows data essential for the computation of "W," and the computed "W." The rankings of skills were derived from data that appears in Appendix C.

TABLE IV

A COMPARISON OF THE SELF-EMPLOYED, EMPLOYED, AND CONTINUING EDUCATION GROUPS OF FORMER STUDENTS

	Order of Importance of Skill to the Job								
Rank	1	2	3	4	5	6	7	8	9
Self-Employed	6.5	4	8	2	9	3	1	6.5	5
Employed	8	6	9	1	4	7	2	5	3
Continuing Education	3.5	6	9	5	3.5	2	1	7	8
Kendall's W = .603	X^2 = 14.472 with df = 8						.10 > p > .05		

	Self-Evaluation of Skills								
	1	2	3	4	5	6	7	8	9
Self-Employed	3	1.5	6	1.5	8	9	5	4	7
Employed	4	2.5	8	1	5	7	2.5	9	6
Continuing Education	1	2	7	3	4.5	8	4.5	9	6
Kendall's W = .773	X^2 = 18.552 with df = 8						.02 > p > .01		

The military group was intentionally left out of the calculations, since the writer felt there was not a sufficient number of them to be validly compared to the other groups. Table IV shows that on this question of importance of skill to the job the three groups had a high degree of agreement in their responses, as indicated by a Kendall's W of .603. This statistic was significant when tested by chi-square at the .02 level.

In a further attempt to describe the population, the writer compared responses of all groups of former students to the responses obtained from the double sample. Table V shows the data necessary to compute the Kendall's W.

TABLE V

A COMPARISON OF THE DOUBLE SAMPLING OF NON-RESPONDENTS TO ALL GROUPS OF FORMER STUDENTS

	Order of Importance of Skill to the Job								
Rank	1	2	3	4	5	6	7	8	9
Double Sample	7	5	7	2	3	7	1	9	4
All Groups	8	5	9	2	3	6	1	7	4
Kendall's W = .946	X^2 = 15.136 with df = 8					.05 > p > .02			
	Self-Evaluation of Skills								
	1	2	3	4	5	6	7	8	9
Double Sample	1	4	8	3	5	6.5	2	9	6.5
All Groups	3	2	7	1	6	9	4	8	5
Kendall's W = .881	X^2 = 14.096 with df = 8					.10 > p > .05			

From this data in Table V the randomly selected double sample of non-respondents showed a high degree of correlation with the total respondents on both questions. On the question of importance of skill to the job, the Kendall's W was .946; and when tested by chi-square, it was significant at the .05 level. The evaluation question had a Kendall's W of .881 and was significant at the .10 level.

After a thorough study of the various groups, and as indicated by Tables IV and V, the writer felt justified in treating all of the groups of former students as one group, since the data showed a high degree of agreement between the responses of the groups. In the analysis of data to follow, therefore, the former students' responses will be treated as one group.

The employer responses were also compared to those of the double sample. Kendall's "W" was utilized again, and a corresponding "W" of .992 was computed from the data on importance of skill to the job. To test the significance of this value, a chi-square was computed. This chi-square value of 15.8 was significant at the .05 level. For the question of evaluating the former students, a "W" of .975 was computed, for which a chi-square of 15.6 was derived, which was also significant at the .05 level.

Having compared both employer and former students to a randomly selected double sampling of the non-respondents, the writer felt there was sufficient agreement in the responses to warrant considering the non-respondents as being no different from the respondents. The writer, therefore, felt that the non-respondents would not bias the study.

Research Questions

Research Question 1

How do former students perceive the importance of the nine skill areas?

Responses to this question were treated in two ways. First, the number of individual responses were recorded across a five-point Likert-type scale and the percentage of the total responses to that particular skill area was computed. Second, the arithmetic means of all responses were computed, and the nine skill areas were rank-ordered in descending order of perceived importance to the job. Table VI shows the number of responses in each category, the mean percentage of the total response to each skill area, the mean score of each skill area, and its rank order of importance to the job.

Due to the equal distribution of responses, it was more meaningful to collapse the first two categories--"of no real importance" and "of some importance"--together to show direction. They were referred to as "less than average importance," while the middle category, "of considerable importance," was referred to as "of average importance." To emphasize the direction of the two upper categories--"of major importance" and "of critical importance"--they were collapsed into a single category of "above average importance."

Power mechanics skills was ranked eighth in order of importance; the mean score derived was 3.228. A perception of less than average importance was indicated by 54 (30 percent) of the former students, while 38 (21.1 percent) indicated power mechanics skills to be of average importance.

TABLE VI

DISTRIBUTION OF FORMER STUDENTS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

Skill Area	How Important Is the Skill to Your Present Job?										Mean Score	Rank Order
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
	N	%	N	%	N	%	N	%	N	%		
Power Mechanics Skills	24	13.3	30	16.7	38	21.1	33	18.3	55	30.6	3.228	8
Machinery & Construction Skills	17	9.4	19	10.6	43	23.9	45	25.0	56	31.1	3.578	5.5
Related Mechanics Skills	41	22.8	32	17.8	24	13.3	42	23.3	41	22.8	3.056	9
Job Practical Knowledge	4	2.2	14	7.8	38	21.1	55	30.6	69	38.3	3.950	2
Job Theoretical Knowledge	12	6.7	16	8.9	52	28.9	53	29.4	57	31.7	2.872	3
Clerical Skills	14	7.8	22	12.2	42	23.3	50	27.8	52	28.9	3.578	5.5
Personnel Relations Skills	7	3.9	13	7.2	22	12.2	59	32.8	79	43.9	4.056	1
Mathematics Skills	10	5.6	32	17.8	42	23.3	53	29.4	42	23.3	3.456	7
Supervisory or Management Skills	12	6.7	28	15.6	29	16.1	54	30.0	57	31.7	3.644	4

In the area of machinery and construction skills, 36 (20 percent) of the respondents indicated it to be of less than average importance. A perception of average importance was indicated by 43 (23.9 percent), while 101 (56.1 percent) perceived machinery and construction skills to be above average in importance. This group of skills had a tied rank of 5.5 with clerical skills. A mean score of 3.578 was derived.

Ninth ranked in order of importance was related mechanics skills. A mean score of 3.056 was computed. This group of skills was perceived to be of less than average importance by 73 (40.6 percent) of the former students. A perception of average importance was indicated by 24 (13.3 percent) and of above average importance by 83 (46.1 percent).

In the area of job practical knowledge, 18 (10 percent) indicated a perception of less than average importance. A perception of average importance was indicated by 38 (21.1 percent) and of above average importance by 124 (68.9 percent). A mean score of 3.95 was determined, which ranked job practical knowledge second in order of importance.

Job theoretical knowledge ranked third. In this area 28 (15.6 percent) perceived it to be of less than average importance. A perception of average was indicated by 52 (28.9 percent), while 110 (61.1 percent) perceived it to be above average in importance. The mean score derived was 3.872.

Clerical skill, which tied ranks with machinery and construction skills at 5.5, had a derived mean score of 3.578. This area was perceived to be of less than average importance by 36 (20 percent) of the former students. A perception of average importance was indicated by 42 (23.3 percent) and of above average importance by 102 (56.7 percent).

The skill area ranked first was personnel relations skills. A perception of less than average importance was indicated by 20 (11.1 percent), while 12.2 percent, or 22 students, indicated average importance. This skill area was perceived to be of above average importance by 138 (76.7 percent), which accounts for the mean score of 4.056.

In the area of math skills, 42 (23.4 percent) indicated a perception of less than average importance. A perception of average importance was indicated by 22 (12.2 percent), and 95 (52.7 percent) indicated math skills to be above average in importance. A mean score of 3.456 was derived. Math skills were ranked seventh in order of importance.

Supervisory or management skills was ranked fourth in order of importance and had a mean score of 3.644. A perception of less than average importance was indicated by 40 (22.3 percent). In this area 29 (16.1 percent) indicated a perception of average importance, and 111 (61.7 percent) indicated a perception of above average importance.

Research Question 2

How do employers of former students perceive the importance of the nine skill area?

Responses to this question were treated in two ways. First, the number of employer responses in each area across a five-point Likert scale was recorded, and then the percentage of the total response to that particular skill area was computed. Second, the means of all responses were computed and the nine skill areas rank ordered in descending order of perceived importance to the job. Table VII shows the number of responses in each category, the mean percentage of the total response to each skill area, the mean score of each skill area, and its rank order of importance to the job.

TABLE VII

DISTRIBUTION OF EMPLOYERS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

	How Important Is This Skill to His Present Job?											
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	11	17.5	12	19.0	11	17.5	19	30.2	10	15.9	3.079	3
Machinery & Construction Skills	11	17.5	12	19.0	15	23.8	16	25.4	9	14.3	3.000	5
Related Mechanics Skills	20	31.7	9	14.3	8	12.7	13	20.6	13	20.6	2.841	8
Job Practical Knowledge	0	--	8	12.7	18	28.5	25	39.7	12	19.0	3.650	1
Job Theoretical Knowledge	6	9.5	16	25.4	18	28.5	20	31.7	3	4.8	2.968	6
Clerical Skills	11	17.5	15	23.8	12	19.0	18	28.5	7	11.1	2.921	7
Personnel Relations Skills	4	6.3	9	14.3	8	12.7	28	44.4	14	22.2	3.619	2
Mathematics Skills	6	9.5	23	36.5	16	25.4	15	23.8	3	4.8	2.777	9
Supervisor or Management Skills	9	14.3	13	20.6	14	22.2	20	31.7	7	11.1	3.048	4

As with research question 1, for discussion purposes the first two categories--"of no real importance" and "of some importance"--were collapsed together to show direction. They were referred to as "less than average importance," while the middle category, "of considerable importance," was referred to as "of average importance." To emphasize the direction of the two upper categories--"of major importance" and "of critical importance"--they were collapsed into a single category of "above average importance."

Power mechanics skills were ranked third in order of importance by the employers. The mean score derived was 3.079. A perception of less than average importance was indicated by 23 (36.5 percent) of the employers. In this area 11 (17.5 percent) indicated a perception of average importance and 29 (46.1 percent) of above average importance.

In the area of machinery and construction skills, 23 (36.5 percent) indicated a perception of less than average importance, while 15 (23.8 percent) perceived it to be of average importance. A perception of above average importance was indicated by 25 (39.7 percent) of the employers. The mean score derived was 3.00, which ranked machinery and construction skills fifth.

The area of related mechanics skills was ranked eighth by the employers. A mean score of 2.841 was derived. A perception of less than average importance was indicated by 29 (46 percent), and 8 (12.7 percent) indicated a perception of average importance. Above average importance was perceived by 26 (41.2 percent) of the employers.

The area ranked first was job practical knowledge. A perception of less than average importance was indicated by only 8 (12.7 percent) of the employers. Eighteen (28.5 percent) individuals perceived this area

to be of average importance, while 37 (58.7 percent) indicated it to be of above average importance. A mean score of 3.65 was derived.

In the area of job theoretical knowledge, 22 (34.9 percent) of the employers indicated a perception of less than average importance, while 18 (28.5 percent) indicated it to be of average importance. A perception of above average importance was indicated by 23 (36.5 percent) of the employers. Job theoretical knowledge was ranked sixth in order of importance to the job and had a mean score of 2.921.

Clerical skills was ranked seventh in order of importance and had a mean score of 2.921. A perception of less than average importance was indicated by 26 (41.3 percent) of the employers. In this area, 12 (19 percent) perceived its importance to be average and 25 (40.6 percent) of above average importance.

In the area of personnel relations skills, 13 (20.6 percent) of the employers indicated a perception of less than average importance, while 8 (12.7 percent) indicated it to be of average importance. A perception of above average importance was indicated by 42 (66.6 percent) of the employers. The mean score determined was 3.619. Personnel relations skills was ranked second in order of importance to the job.

The area ranked last (ninth) in order of importance was mathematics skills. This area had a mean score of 2.777. A perception of less than average importance was indicated by 29 (46.0 percent) of the employers and of average importance by 16 (25.4 percent), while 18 (28.6 percent) indicated an above average importance.

Supervisory and management skills were ranked fourth and had a mean score of 3.048. A perception of less than average importance was indicated by 22 (34.9 percent) of the employers and of average

importance by 14 (22.2 percent). This area was considered to be of above average importance by 27 (42.8 percent) of the employers.

Research Question 3

How do employer and former student perceptions of importance of the nine skill areas to the job compare?

The degree of agreement or disagreement was indicated by two treatments of the data regarding former student and employer perception of the importance of the nine skill areas to the job. The two treatments chosen were the Pearson Product Moment Correlation Coefficient and the Kendall's Coefficient of Concordance.

Since the Pearson Product Moment Correlation Coefficient deals with matched pairs of subjects, it was necessary to match employers to the former students that worked for them. As can be noted in Table II, there were 87 former students that were employed. In addition, as can be noted in Table I, there were 63 employer responses. Of these, only 53 could be matched with a former student.

Table VIII shows that eight of the nine skill areas reached a value that was found to be statistically signficant at the .05 level. This implies that former students and their employers view the importance of the skill areas to the job in essentially the same manner. The one area that indicated a disagreement between employer and former student responses was power mechanics skills, but the level of significance indicated that the agreement or disagreement in that area could have occurred by chance.

The Kendall's Coefficient of Concordance measures the extent of association among several sets of rankings of two or more items or

TABLE VIII

VALUES OF PEARSON PRODUCT MOMENT CORRELATION COEFFICIENT DERIVED FROM COMPARED EMPLOYER AND FORMER STUDENT PERCEPTION ON IMPORTANCE OF SKILL TO THE JOB

Skill Area	Value	Significant	p
Power Mechanics Skills	.049	No	$p > .10$
Machinery & Construction Skills	.691	Yes	$p < .01$
Related Mechanics Skills	.452	Yes	$p < .01$
Job Practical Knowledge	.451	Yes	$p < .01$
Job Theoretical Knowledge	.311	Yes	$.05 > p > .02$
Clerical Skills	.360	Yes	$p < .01$
Personnel Relations Skills	.563	Yes	$p < .01$
Mathematics Skills	.414	Yes	$p < .01$
Supervisory or Management Skills	.801	Yes	$p < .01$

$df = 53$ $\alpha = .05$

Significance value at $\alpha = .266$

persons. Table IX consolidates information from Tables VI and VII. To be specific, it shows the relative importance of the nine skill areas as perceived by former students and their employers. The means were taken from Tables VI and VII and then shown and graphed in Table IX. This table also shows the rank order for each of the skill areas in order of importance to the job. The Kendall's Coefficient of Concordance, W, was .835, which indicates a high degree of association between former students and their employers in regard to the importance of the nine skill areas to the job.

The statistic W must be tested for significance by computing a chi-square. The null hypothesis, H_o, stated for the Kendall's chi-square test is that the two rankings are not related. A significant chi-square value would indicate that the rankings were related.

The chi-square computed to test the significance of the statistic W was 13.36. This value is significant at the .10 level, which indicates that this degree of agreement could have occurred by chance only 10 times out of 100.

Research Question 4

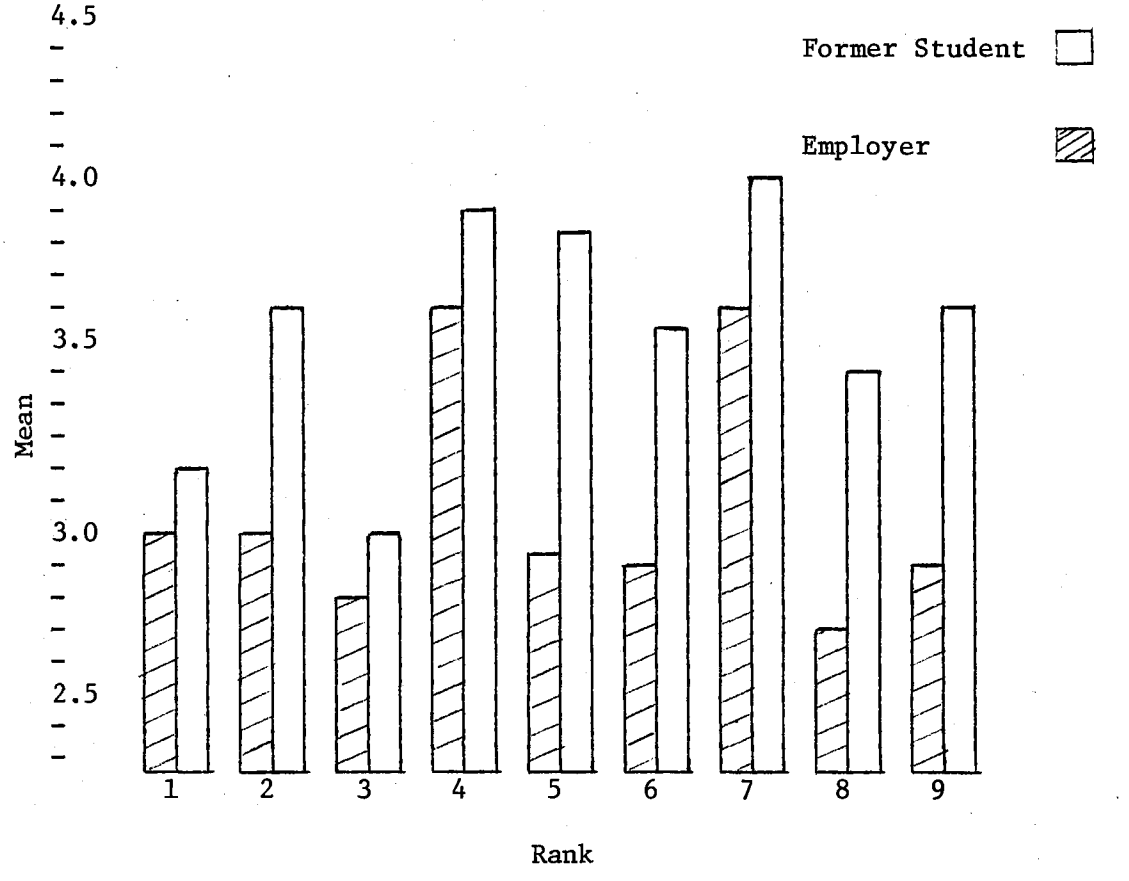
According to employer responses, what is the order of importance of the nine skill areas?

The computed means were utilized to determine the rank order shown for each of the skills in Table IX. This ranking shows the relative importance of each skill as perceived by the employers of former students.

Employers perceived the importance of the skill areas to be ranked as follows:

TABLE IX

FORMER STUDENT-EMPLOYER PERCEPTIONS OF RELATIVE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB



Skill Areas	Employers Mean	Employers Rank	Employees Mean	Employees Rank
1. Power Mechanics Skills	3.079	3	3.228	8
2. Machinery & Construction Skills	3.000	5	3.578	5.5
3. Related Mechanics Skills	2.841	8	3.056	9
4. Job Practical Knowledge	3.650	1	3.950	2
5. Job Theoretical Knowledge	2.968	6	3.872	3
6. Clerical Skills	2.921	7	3.578	5.5
7. Personnel Relations Skills	3.619	2	4.056	1
8. Mathematics Skills	2.777	9	3.456	7
9. Supervisory or Management Skills	3.048	4	3.644	4

Kendall's Coefficient of Concordance

$W = .835$ $X^2 = 13.36$ Significant at .10 level

Rank	Skill Area
1.	Job Practical Knowledge
2.	Personnel Relations Skills
3.	Power Mechanics Skills
4.	Supervisory or Management Skills
5.	Machinery and Construction Skills
6.	Job Theoretical Knowledge
7.	Clerical Skills
8.	Related Mechanics Skills
9.	Mathematics Skills

Research Question 5

According to former students' responses, what is the order of importance of the nine skill areas?

As with research question 4, the computed means were utilized to determine the rank order shown for each of the skills in Table IX. This ranking shows the relative importance of each skill as perceived by the former students. These former students perceived the importance of the skill areas to be ranked as follows:

Rank	Skill Area
1.	Personnel Relations Skills
2.	Job Practical Knowledge
3.	Job Theoretical Knowledge
4.	Supervisory or Management Skills
5.5	Clerical Skills
5.5	Machinery and Construction Skills
7.	Mathematics Skills

Rank	Skill Area
8.	Power Mechanics Skills
9.	Related Mechanics Skills

Research Question 6

How do former students evaluate themselves as to competence in each of the nine skill areas?

Responses to this question were treated in the same manner as question 1. First, the number of individual responses were recorded across a five-point Likert-type scale and the percentage of the total response to that particular skill area was computed. Second, the arithmetic means of all responses were computed and the nine skill areas rank ordered in descending order of perceived competency. Table X shows the number of responses in each category, the mean percentage of the total response to each skill area, the mean score of each skill area, and its rank order of importance.

For discussion purposes the first two categories--"need much improvement" and "generally below average"--were collapsed together to show direction. They were referred to as "below average," while the middle category, "average" will remain as such. To emphasize the direction of the two upper categories--"generally above average" and "outstanding"--they were collapsed into a single category of "above average."

Power mechanics skills was ranked second in order of competence. The mean score derived was 3.383. A perception of below average was indicated by 14 (7.8 percent) of the former students, while 86 (47.8 percent) indicated that they were average in power mechanics skills,

TABLE X

DISTRIBUTION OF FORMER STUDENTS REGARDING THEIR SELF-EVALUATION OF THE NINE SKILL AREAS

Skill Area	How Would You Evaluate Yourself on This Skill?										Mean Score	Rank Order
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
	N	%	N	%	N	%	N	%	N	%		
Power Mechanics Skills	5	2.8	9	5.0	86	47.8	72	40.0	8	4.4	3.383	2
Machinery & Construction Skills	0	-	13	7.2	76	42.2	70	38.9	11	6.1	3.272	4
Related Mechanics Skills	5	2.8	31	17.2	93	51.7	44	24.4	7	3.9	3.094	7
Job Practical Knowledge	1	0.6	9	5.0	82	45.6	92	51.1	6	3.3	3.683	1
Job Theoretical Knowledge	3	1.7	24	13.3	96	53.3	52	28.9	5	2.8	3.178	6
Clerical Skills	6	3.3	35	19.4	86	47.8	50	27.8	3	1.7	3.050	8
Personnel Relations Skills	3	1.7	16	8.9	81	45.0	71	39.4	9	5.0	3.372	3
Mathematics Skills	14	7.8	32	17.8	76	42.2	50	27.8	8	4.4	3.033	9
Supervisory or Management Skills	1	0.6	19	10.6	107	59.4	52	28.9	1	0.6	3.183	5

and 80 (44.4 percent) perceived that they were above average in competency in this area.

In the area of machinery and construction skills, 13 (7.2 percent) of the respondents indicated that they were below average. A perception of average competency was indicated by 76 (42.2 percent), while 81 (45.9 percent) perceived that they were of above average competency. This group of skills was ranked fourth in order of competency and a mean score of 3.272 was derived.

Seventh ranked in order of competence was related mechanics skills. A mean score of 3.094 was computed. This group of skills was perceived to be of below average competence by 36 (20 percent) of the former students. A perception of average competence was indicated by 93 (51.7 percent) and of above average competency by 81 (45 percent).

In the area of job practical knowledge, 10 (5.6 percent) indicated a perceived competence of less than average. A perception of average competency was indicated by 82 (45.6 percent) and of above average by 98 (54.4 percent). A mean score of 3.683 was determined, which ranked job practical knowledge number one in order of competency.

Job theoretical knowledge ranked sixth. In this area 27 (15 percent) perceived that they were below average. A perception of average was indicated by 96 (53.3 percent), while 57 (31.7 percent) perceived it to be an area of above average competency. The mean score derived was 3.178.

Clerical skills was ranked eighth and had a derived mean score of 3.05. This area was perceived to be of below average competency by 41 (22.7 percent) of the former students. A perception of average competency was indicated by 86 (47.8 percent) and of above average competency by 53 (29.5 percent).

The skill area ranked third was personnel relations skills. A perception of below average competency was indicated by 19 (10.5 percent) of the former students, while 81 (45 percent) indicated a competency of average. This skill area was perceived to be of above average by 80 (44.4 percent). A mean score of 3.372 was derived.

In the area of math skills, 46 (25.6 percent) indicated a perceived competency of below average. A perception of average competency was indicated by 76 (42.2 percent), and 58 (32.2 percent) indicated that they were above average in math skills. A mean score of 3.033 was derived, which ranked math skills ninth in order of competence.

Supervisory and management skills was ranked fifth in order of competence and had a mean score of 3.183. A perceived competency of below average was indicated by 20 (11.2 percent). In this area 107 (59.4 percent) perceived themselves to be of average competency, while 53 (29.5 percent) indicated a competency of above average.

Research Question 7

How do employers of former students evaluate the former students' competence in the nine skill areas?

Responses to this question were treated in the same manner as questions 1 and 6. First, the number of individual responses were recorded across a five-point Likert-type scale, and the percentage of the total response to that particular skill area was computed. Second, the arithmetic means of all responses were computed, and the nine skill areas were rank ordered in descending order of perceived competency. Table XI shows the number of responses in each category, the mean percentage of the total response to each skill area, the mean score of each skill area, and its rank order of competency.

TABLE XI

DISTRIBUTION OF EMPLOYERS REGARDING THEIR EVALUATION OF FORMER STUDENTS IN THE NINE SKILL AREAS

	How Would You Evaluate Him on This Skill?											
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	1	1.6	1	1.6	29	46.0	27	42.8	5	7.9	3.539	2
Machinery & Construction Skills	1	1.6	2	3.2	26	41.3	27	42.8	7	11.1	3.587	1
Related Mechanics Skills	2	3.2	1	1.6	37	58.7	22	34.9	1	1.6	3.3016	7.5
Job Practical Knowledge	1	1.6	0	-	33	52.4	24	38.1	5	7.9	3.507	3
Job Theoretical Knowledge	0	-	5	7.9	34	53.9	21	33.3	3	4.8	3.349	5
Clerical Skills	1	1.6	6	9.5	38	60.3	15	23.8	3	4.8	3.206	9
Personnel Relations Skills	0	-	5	7.9	27	42.8	26	41.3	5	7.9	3.492	4
Mathematics Skills	2	3.2	5	7.9	30	47.6	23	36.5	3	4.8	3.317	6
Supervisory or Management Skills	0	-	8	12.7	31	49.2	21	33.3	3	4.8	3.3016	7.5

As with research question 6, for discussion purposes the first two categories--"needs much improvement" and "generally below average"--were collapsed together to show direction. They were referred to as "below average," while the middle category, "average," remained the same. To emphasize the direction of the two upper categories--"generally above average" and "outstanding"--they were collapsed into a single category of "above average."

Power mechanics skills were ranked second in order of competence by the employers. The mean score derived was 3.539. A perceived competency of below average was indicated by 2 (3.2 percent) of the employers. In this area 29 (46 percent) indicated a competency of average and 32 (50.7 percent) a competency of above average.

In the area of machinery and construction skills, 3 (4.8 percent) indicated a competency of below average, while 26 (41.3 percent) perceived that former students were of average competency. Thirty-four (53.9 percent) indicated a perceived competency of above average for the former students. The mean score derived was 3.587, which ranked machinery and construction skills first in order of competence.

The area of related mechanics skills had a tied rank of 7.5 with supervisory or management skills. A mean score of 3.3016 was derived. Three (4.8 percent) of the employers perceived former students to be of below average competence in this area. Average competency was perceived by 37 (58.7 percent) and above average by 23 (36.5 percent).

The area ranked third was job practical knowledge. A perception of below average competency was indicated by only one (1.6 percent) of the employers. Thirty-three (52.4 percent) of the employers perceived the former students to be of average competence in this area, while 29

(46 percent) indicated a competency of above average. A mean score of 3.507 was derived.

In the area of job theoretical knowledge, five (7.9 percent) employers indicated a competency of below average, while 34 (53.9 percent) perceived the former students to be average. A perception of above average was indicated by 24 (38.1 percent) of the employers. Job theoretical knowledge was ranked fifth and had a mean score of 3.349.

Clerical skills was ranked last (ninth) in order of competency and had a mean score of 3.206. Five (7.9 percent) of the employers perceived the former students to be of below average competence in this area, while 27 (42.8 percent) indicated a competency of average and 31 (49.2 percent) indicated that former students were above average in competency.

In the area of mathematics skills, seven (11.1 percent) of the employers indicated that former students were below average in competency. A perceived competency of average was indicated by 30 (47.6 percent) of the employers and above average by 26 (41.3 percent). A mean score of 3.317 was derived, and a rank of sixth was assigned.

Supervisory and management skills were ranked 7.5, being tied with related mechanics skills. This area had a mean score of 3.3016. A perception of below average was indicated by eight (12.7 percent) of the employers and of average competence by 31 (49.2 percent). This area was considered to be of above average competence by 24 (38.1 percent) of the employers.

Research Question 8

How do employer and former student perceptions of competencies in the nine skill areas compare?

The degree of agreement or disagreement was indicated by two treatments of the data regarding former student and employer perception of competency in the nine skill areas. The two treatments chosen were the Pearson Product Moment Correlation Coefficient and the Kendall's Coefficient of Concordance.

As with research question 3, it was necessary to use the matched pairs in the calculation of the Pearson Product Moment Correlation Coefficient. The same group of 53 matched pairs was used.

Table XII shows that eight of the nine skill areas reached a value that was found to be statistically significant at the .05 level. This implies that the former students and their employers perceive the students' competency in each of the nine skill areas in essentially the same manner. The one area that indicates a disagreement between employer and former student was power mechanics skills, which indicates that the agreement or disagreement in that area could have occurred by chance.

Kendall's Coefficient of Concordance was again used to measure the extent of association between the competency rankings established by employers and former students. Table XIII consolidates information from Tables X and XI. It shows the relative competencies in the nine skill areas as perceived by former students and their employers. The means were taken from Tables X and XI. They were shown and graphed in Table XIII. This table also shows the rank order for each of the skill areas in order of competence. The Kendall's Coefficient of Concordance, W, was .852, which indicates a high degree of association between former students and their employers when evaluating competency of former students in the nine skill areas.

TABLE XII

VALUES OF PEARSON PRODUCT MOMENT CORRELATION COEFFICIENT DERIVED FROM COMPARED EMPLOYER AND FORMER STUDENT PERCEPTION COMPETENCY IN EACH OF THE NINE SKILL AREAS

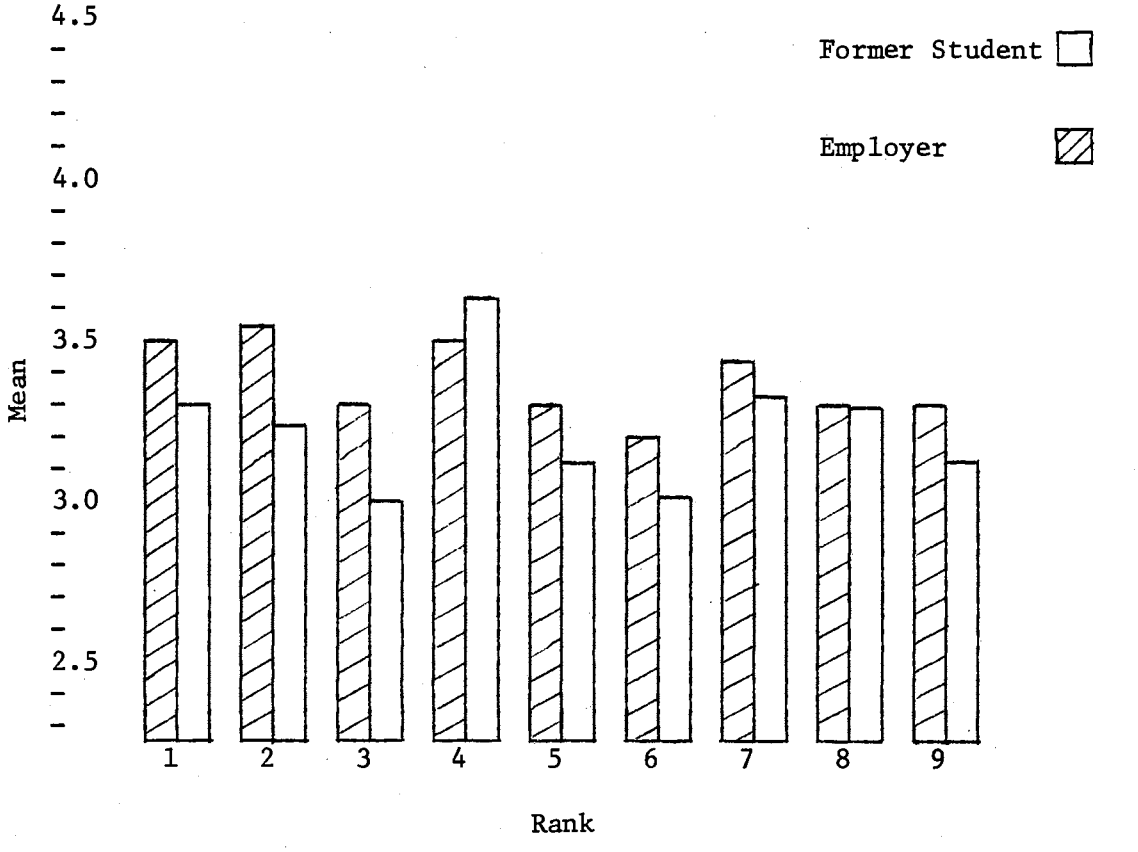
Skill Area	Value	Significant	p
Power Mechanics Skills	.223	No	$p = .10$
Machinery & Construction Skills	.500	Yes	$p < .01$
Related Mechanics Skills	.410	Yes	$p < .01$
Job Practical Knowledge	.460	Yes	$p < .01$
Job Theoretical Knowledge	.309	Yes	$.05 > p > .02$
Clerical Skills	.473	Yes	$p < .01$
Personnel Relations Skills	.486	Yes	$p < .01$
Mathematics Skills	.471	Yes	$p < .01$
Supervisory or Management Skills	.280	Yes	$.05 > p > .02$

$df = 53$ $\alpha = .05$

Significance at $\alpha = .266$

TABLE XIII

FORMER STUDENT-EMPLOYER PERCEPTION OF STUDENT COMPETENCY IN THE NINE SKILL AREAS



Skill Areas	Employers Mean	Employers Rank	Employees Mean	Employees Rank
1. Power Mechanics Skills	3.539	2	3.383	2
2. Machinery & Construction Skills	3.587	1	3.272	4
3. Related Mechanics Skills	3.3016	7.5	3.094	7
4. Job Practical Knowledge	3.507	3	3.683	1
5. Job Theoretical Knowledge	3.349	5	3.178	6
6. Clerical Skills	3.206	9	3.050	8
7. Personnel Relations Skills	3.492	4	3.372	3
8. Mathematics Skills	3.317	6	3.3033	9
9. Supervisory or Management Skills	3.3016	7.5	3.183	5

Kendall's Coefficient of Concordance

$W = .852$ $X^2 = 13.632$ Significance = .10 p .05

The statistic W must be tested for significance by computing a chi-square. The null hypothesis, H_o, stated for the Kendall's chi-square test is that the two rankings are not related. A sufficient chi-square value would indicate that the rankings were related. The chi-square computed to test the significance of the statistic W was 13.632. This value is significant at the .10 level, which indicates that this degree of agreement could have occurred by chance 10 times out of 100.

Research Question 9

Do former students perceive a need for further training in any of the nine skill areas?

Table XIV shows perceptions of former students regarding the need for additional training in each of the nine skill areas.

TABLE XIV

PERCEPTIONS OF FORMER STUDENTS REGARDING NEED FOR FURTHER TRAINING

	Further Training			
	Yes		No	
Skill Area	N	%	N	%
Power Mechanics Skills	112	62.2	68	37.8
Machinery & Construction Skills	108	60.0	72	40.0
Related Mechanics Skills	117	65.0	63	35.0
Job Practical Knowledge	127	70.6	53	29.4
Job Theoretical Knowledge	122	67.8	58	32.2
Clerical Skills	126	70.0	54	30.0
Personnel Relations Skills	131	72.8	49	27.2
Mathematics Skills	128	71.1	52	28.9
Supervisory or Management Skills	138	76.7	42	23.3

In the area of power mechanics skills, 112 (62.2 percent) of the former students perceived a need for more instruction or training, while 68 (37.8 percent) indicated that they did not perceive such a need. The former students responded in a similar fashion in the area of machinery and construction skills, where 108 (60 percent) indicated a need for further training and 72 (40 percent) did not perceive a need for more training.

Sixty-five percent (117 students) perceived a need for further training or instruction in the area of related mechanics skills, and 63 (35 percent) perceived no such need. Job practical knowledge was an area where 70.6 percent (127 students) indicated a perceived need for further training, leaving 53 (29.4 percent) responding negatively to such a need.

Job theoretical knowledge was an area where 122 (67.8 percent) indicated a need for further training, while 58 (32.2 percent) perceived no such need. The area of clerical skills was indicated by 126 (70 percent) as an area where further training or instruction was needed. Thirty percent (54 students) indicated that they did not perceive a need for further training or instruction in the area of clerical skills.

In the area of personnel relations skills, 131 (72.8 percent) of the former students perceived a need for more instruction or training, while 49 (27.2 percent) indicated that they did not perceive such a need. The former students responded in a similar fashion in the area of mathematic skills, where 128 (71.1 percent) indicated a perceived need for further training while 52 (28.9 percent) did not perceive a need for further training.

The area which former students perceived the greatest need for more

instruction or training was the area of supervisory or management skills. This was indicated by 138 (76.7 percent) perceiving a need for further training and 42 (23.3 percent) responding negatively to such a need.

Research Question 10

Do employers of former students perceive a need for further training in any of the nine skill areas?

Table XV shows perceptions by employers regarding the need for further training in each of the nine skill areas.

TABLE XV

PERCEPTIONS OF EMPLOYERS OF FORMER STUDENTS REGARDING THE NEED FOR FURTHER TRAINING

	Do You Feel He Needs Further Training			
	Yes		No	
Skill Areas	N	%	N	%
Power Mechanics Skills	33	52.4	30	47.6
Machinery & Construction Skills	29	46.1	34	53.9
Related Mechanics Skills	32	50.8	31	49.2
Job Practical Knowledge	34	53.9	29	46.1
Job Theoretical Knowledge	38	60.3	25	39.7
Clerical Skills	34	53.9	29	46.1
Personnel Relations Skills	37	58.7	26	41.3
Mathematics Skills	34	53.9	29	46.1
Supervisory or Management Skills	36	57.1	27	42.9

In regard to the question, "Do you feel he needs further instruction or training in this area," 33 (52.4 percent) of the employers indicated that they perceived a need for further training in the area of power mechanics skills, while 30 (47.6 percent) indicated that they did not perceive such a need. Twenty-nine (46.1 percent) indicated that further training was needed in machinery and construction skills, but 53.9 percent (34 employers) perceived that no further training was needed in this area.

The employers were divided evenly in the area of related mechanics skills, where 32 (50.8 percent) indicated a need for further training and 31 (49.2 percent) indicated that no further training was necessary. Job practical knowledge was an area where 34 (53.9 percent) perceived a need for further training, leaving 29 (46.1 percent) responding negatively to such a need.

Job theoretical knowledge was an area where 38 (60.3 percent) indicated a need for further training while 25 (39.7 percent) perceived no such need. The area of clerical skills was indicated by 34 (53.9 percent) as an area where further training or instruction was needed. Twenty-nine employers (46.1 percent) indicated that they did not perceive a need for further training or instruction in the area of clerical skills.

In the area of personnel relations skills, 37 (58.7 percent) of the employers perceived a need for more instruction or training, while 26 (41.3 percent) indicated that they did not perceive such a need. The employers responded in a similar fashion in the area of mathematical skills, where 34 (53.9 percent) indicated a perceived need for further training while 29 (46.1 percent) did not perceive a need for further training.

Supervisory or management skills was an area where 36 (57.1 percent) employers perceived a need for further training or instruction for the former students. Twenty-seven (42.9 percent) did not perceive that further training was necessary.

Research Question 11

How do employers' and former students' perceptions of further training compare?

The responses of former students and employers were examined utilizing the chi-square test; the null hypothesis posited was that there was no difference in the perception of employers and former students with regard to the need for further training. The significance level was established at .05, which would mean that a significant value would occur by chance 5 times in 100. Results are shown in Table XVI.

In all but three areas the null hypothesis was rejected. These three areas were (1) power mechanics skills, (2) related mechanics skills, and (3) job theoretical knowledge. This would indicate that employers and former students do not perceive the need for further training or instruction in the same manner.

Research Question 12

According to responses, where do former students perceive they learned the most about each of the nine skill areas?

Individual responses to this question were recorded for each skill area as to where the most of that skill was learned. The percentage of the total response for each skill was determined. Table XVII shows the number of individual responses in each category and the percentage of the total response to each skill area.

TABLE XVI

CHI-SQUARE VALUES DERIVED FROM COMPARISON OF FORMER STUDENTS' AND THEIR EMPLOYERS' PERCEPTIONS OF THE NEED FOR FURTHER TRAINING OR INSTRUCTION

Skill Areas	Chi-Square Values	Reject or Accept H_o
Power Mechanics Skills	.728	Accept
Machinery & Construction Skills	4.529	Reject
Related Mechanics Skills	2.174	Accept
Job Practical Knowledge	4.480	Reject
Job Theoretical Knowledge	.672	Accept
Clerical Skills	5.027	Reject
Personnel Relations Skills	4.175	Reject
Mathematical Skills	6.931	Reject
Supervisory or Management Skills	7.307	Reject
.05 Value = 3.84	df = 1	
H_o: $N_1 = N_2$	H_1: $N_1 \neq N_2$	

In the areas of power mechanics skills, machinery and construction skills, related mechanics skills, and clerical skills, at least 70 percent of the former students perceived they learned most of that skill in the Modesto Junior College Agricultural Mechanics program. The remainder of the responses were distributed across the other four categories, with "on the regular job" being the next place where the student learned about the skill.

The remaining areas ranged from 52.8 percent to 68.3 percent of the former students perceiving that they learned most about that skill in the Modesto Junior College Agricultural Mechanics program. In all cases, except mathematics, the next most significant place for learning

TABLE XVII

WHERE FORMER STUDENTS LEARNED MOST ABOUT THE NINE SKILL AREAS

Skill Area	High School		M.J.C. Ag. Mechanics		Apprentice Program		On Regular Job		Elsewhere	
	1		2		3		4		5	
	N	%	N	%	N	%	N	%	N	%
Power Mechanics Skills	5	2.8	141	78.3	1	0.6	19	10.6	14	7.8
Machinery & Construction Skills	7	3.9	142	78.9	2	1.1	23	12.8	9	5.0
Related Mechanics Skills	10	5.6	137	76.1	1	0.6	17	9.4	15	8.3
Job Practical Knowledge	2	1.1	104	57.8	6	3.3	64	35.6	4	2.2
Job Theoretical Knowledge	5	2.8	123	68.3	5	2.8	39	21.7	8	4.4
Clerical Skills	12	6.7	126	70.0	2	1.1	23	12.8	17	9.4
Personnel Relations Skills	5	2.8	95	52.8	2	1.1	45	25.0	33	18.3
Mathematics Skills	32	17.8	117	65.0	2	1.1	13	7.2	16	8.9
Supervisory or Management Skills	4	2.2	102	56.7	2	1.1	44	24.4	28	15.6

that skill was "on the regular job." As for mathematics, 17.8 percent of the former students felt they learned the most about that skill in high school.

Research Question 13

According to responses, how do employers compare former students with other entry level workers who received training other than the Modesto Junior College Agricultural Mechanics program?

Responses to this question were treated in two ways. First, the number of individual responses were recorded across a five-point Likert-type scale and the percentage of the total response to that particular skill area was computed. Second, the arithmetic means of all responses were computed, from which an overall mean for all nine skill areas was computed. Results are recorded in Table XVIII.

Due to the equal distribution of responses, it was more meaningful to collapse the first two categories--"falls in low 5 percent" and "falls in lower 20 percent"--together to show direction. They were referred to collectively as "below average," while the middle category, "falls in the middle 50 percent," was called "average." To emphasize the direction of the two upper categories--"falls in the upper 20 percent" and "falls in the upper 5 percent"--they were collapsed into a single group of "above average."

In the area of power mechanics skills, only four (6.3 percent) of the employers rated former students below average when compared to other entry level workers who had received training other than Modesto Junior College Agricultural Mechanics. Twenty-one (33.3 percent) perperceived that they were average, and 38 (60.3 percent) rated them above average. The mean score derived was 3.66.

TABLE XVIII

EMPLOYERS' COMPARISON OF FORMER STUDENTS WITH OTHER ENTRY LEVEL WORKERS

Skill Area	Falls in Lower 5%		Falls in Lower 20%		Falls in Middle 50%		Falls in Upper 20%		Falls in Upper 5%		Mean Score	Rank Order
	1		2		3		4		5			
	N	%	N	%	N	%	N	%	N	%		
Power Mechanics Skills	0	0.0	4	6.3	21	33.3	30	47.6	8	12.7	3.660	1
Machinery & Construction Skills	0	0.0	5	7.9	23	36.5	26	41.3	9	14.3	3.619	2
Related Mechanics Skills	0	0.0	7	11.1	30	47.6	22	34.9	4	6.3	3.365	7
Job Practical Knowledge	0	0.0	4	6.3	26	41.3	27	42.8	6	9.5	3.555	3
Job Theoretical Knowledge	0	0.0	4	6.3	36	57.1	21	33.3	2	3.2	3.333	8
Clerical Skills	0	0.0	7	11.1	28	44.4	24	38.1	4	6.3	3.3968	5.5
Personnel Relations Skills	0	0.0	7	11.1	27	42.8	22	34.9	7	11.1	3.460	4
Mathematics Skills	0	0.0	10	15.9	30	47.6	19	30.2	4	6.3	3.2698	9
Supervisory or Management Skills	0	0.0	7	11.1	27	42.8	26	41.3	3	4.8	3.3968	5.5

Machinery and construction skills had a mean score of 3.619. A perception of below average was indicated by five (7.9 percent) of the employers, while 23 (36.5 percent) perceived the former students to be average when compared to other entry level workers. An above average rating was perceived by 35 (56.2 percent) of the employers.

A perception of below average was indicated by seven (4.1 percent) of the employers in the area of related mechanics skills. Thirty (47.6 percent) of the employers perceived former students to be average, while 26 (41.2 percent) indicated an above average perception when comparing former students with other entry level workers. The mean score for related mechanics skills was 3.365.

In the area of job practical knowledge, four (6.3 percent) of the employers rated former students below average, while 26 (41.3 percent) perceived them to be average and 33 (52.3 percent) indicated that the former students were above average when compared to entry level workers who had received training other than Modesto Junior College Agricultural Mechanics program. A mean score of 3.555 was derived.

Job theoretical knowledge had a mean score of 3.333. A perception of below average was perceived by four (6.3 percent) of the employers, while 36 (57.1 percent) perceived the students to be average when compared to other entry level workers. An above average rating was perceived by 23 (36.5 percent) of the employers.

A perception of below average was indicated by seven (11.1 percent) of the employers in the area of clerical skills. Twenty-eight (44.4 percent) of the employers perceived former students to be average, while 28 (44.4 percent) indicated an above average perception when comparing former students to other entry level workers. The mean score derived was 5.5.

In the area of personnel relations skills, seven (11.1 percent) of the employers rated former students below average, while 27 (42.8 percent) perceived them to be average and 29 (46 percent) indicated that former students were above average when compared to entry level workers who had received training other than Modesto Junior College Agricultural Mechanics program. A mean score of 3.460 was derived.

Mathematics skills had a mean score of 3.2698, which indicated that this area was perceived by employers to be the area where former students scored lowest when compared to other entry level workers. A perception of below average was perceived by 10 (15.9 percent) of the employers, while 30 (47.6 percent) perceived the students to be average and 23 (36.5 percent) indicated a perception of above average.

A perception of below average was indicated by seven (11.1 percent) of the employers in the area of supervisory or management skills. Twenty-seven (42.8 percent) of the employers perceived former students to be average, while 29 (46.1 percent) indicated an above average perception when comparing former students to other entry level workers. The mean score derived was 3.3968.

Summary of Selected Student Comments

Student response on the open-ended item was very favorable. For the most part they were satisfied with the instruction and training they received from the Agricultural Mechanics program at Modesto. There were several suggestions and some criticism in the following areas:

1. Articulation with four-year institutions.
2. A need for more training in the supervisory and management skill area.

3. A need for more training in personnel relations.
4. A need for more training in diesel engines.
5. A need for a closer relationship between Agricultural Mechanics instructors and the industry to improve work experience opportunities for students.

Summary

The data presented in this chapter would indicate that the former students of the Modesto Junior College Agricultural Mechanics Program and their employers perceive the importance of the various skills to the job and the evaluation of their skills in much the same way. When employer and former student responses were compared with Kendall's Coefficient of Concordance, there was a high degree of correlation indicated. When the perceived need for further training was analyzed by computing a chi-square to ascertain the degree of agreement or disagreement between the two groups, only three failed to reject the null hypothesis at the .05 level of significance. This would indicate that the former students and their employers did not perceive the need for further training in the same way on the majority of the skill areas. The data also indicates that in all skill areas the majority of the former students felt they received most of their training at Modesto Junior College. An overall mean of 3.45 was derived from employer evaluation of former students when compared to entry level workers who received training other than at Modesto Junior College Agricultural Mechanics program. This indicates that employers tend to rate former students above other entry level workers. Selected comments of students

included in Appendix D indicate that most were pleased with their programs at Modesto Junior College. There were several areas where former students indicated an improvement may better prepare them for employment.

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The problem for this study was the lack of information available with which to evaluate programs and make proper decisions to effect curriculum changes which are necessary to properly prepare vocational technical students in the Agricultural Mechanics program at Modesto Junior College. The objectives were to evaluate perceptions of former students and their employers regarding (1) the importance of the nine skill areas to the job, (2) an evaluation of the former students in each skill area, (3) how former students' and employers' perceptions compared, (4) the need for additional training, (5) where the former students learned the most about the nine skill areas, and (6) how the employers evaluated the former students when compared to other entry level workers.

Mailed questionnaires were utilized as the data collecting instrument. A questionnaire was mailed to each student who had been enrolled in the Agricultural Mechanics program from 1965 to 1972. The second questionnaire was presented to their employers. Common to both questionnaires were the nine skill areas and questions concerning (1) importance of the skill area to the job, (2) evaluation of the skill area, and (3) need for further training in each skill area.

April 13, 1973, was the closing date of the study. At that time there were 170 (75.6 percent) student returns and 59 (67.8 percent)

employer returns. On this date a 25 percent random double sampling was drawn from the non-respondents. This random double sample was contacted personally to encourage their responses. The double sampling was given two weeks, until April 27, when the total returns were 181 (80.4 percent) of the former students and 63 (72.4 percent) of the employers.

Findings

An analysis of the returns indicates the following:

Of the 181 former students who responded, 48.1 percent were working for someone, 28.7 percent were self-employed, 19.8 percent were continuing their education, 2.8 percent were in the military service, and one (0.6 percent) was not complete and could not be tallied. There was no indication of unemployment. Further analysis of the data showed 139 former students were employed or self-employed, 29.5 percent of which were involved in production agriculture (on the farm). This employment distribution further showed that 43.2 percent of the former students were working in agricultural mechanics (off the farm). There were 17.2 percent working in other fields of mechanics not related to agriculture, and only 10.1 percent working in unrelated occupations.

Examination of the data in Chapter IV indicates that the four categories (employed, self-employed, continuing education, and military) of former students all responded in relatively the same manner. A Kendall's Coefficient of Concordance calculated on the rank order of the nine skill areas revealed a W of .773, which reached a significance level of .02.

When examining the rank ordering of the nine skill areas in order of importance to the job, as perceived by former students and their

employers, a high degree of agreement was indicated. The skill areas were ranked by former students and their employers as follows:

Skill	Rank Ordering	
	Employers	Former Students
Power Mechanics Skills	3	8
Machinery and Construction Skills	5	5.5
Related Mechanics Skills	8	9
Job Practical Knowledge	1	2
Job Theoretical Knowledge	6	3
Clerical Skills	7	5.5
Personnel Relations Skills	2	1
Mathematics Skills	9	7
Supervisory or Management Skills	4	4

Kendall's Coefficient of Concordance, calculated on the rank ordering of mean scores of the nine skill areas, revealed a W of .835 which reached a statistically significant level at .10. A further indication of correlation was the calculation of a Pearson Product Moment Correlation Coefficient for each of the nine skill areas. The statistic r was found to be significant at the .05 level in all areas but power mechanics skills.

Further examination of the data revealed that rank ordering of skill areas in order of competency showed an even higher degree of agreement between former students and their employers. The following rankings were assigned in order of competency of former students in each of the skill areas:

Skill	Rank Ordering	
	Employers	Former Students
Power Mechanics Skills	2	2
Machinery and Construction Skills	1	4
Related Mechanics Skills	7.5	7
Job Practical Knowledge	3	1
Job Theoretical Knowledge	5	6
Clerical Skills	9	8
Personnel Relations Skills	4	9
Mathematics Skills	6	9
Supervisory or Management Skills	7.5	5

A Kendall's Coefficient of Concordance calculated on the question of former student and employer evaluation of student competency in each skill area revealed a W of .923, which reached a level of significance at the .10 level. For each of the nine skill areas, a Pearson Product Moment Correlation Coefficient was calculated and found to be significant at the .05 level in all cases but power mechanics skills. On that skill area the significance level was .10.

In regard to the question of need for further training, at least 60 percent of the former students perceived a need for further training in all areas. The employers did not perceive the need for further training as strongly. In all cases but job theoretical knowledge the percent of employers perceiving a need for further training was less than 60 percent. A chi-square test was conducted to examine the responses of the former students and their employers. The null hypothesis posited was that there was no difference in the perceptions of former students and their employers in regard to the need for further training. The .05 level of rejection was chosen, and all but three skill areas (power mechanics skills, related mechanics, and job theoretical knowledge) rejected the null hypothesis, which indicates an agreement in regard to the need for further training between former students and their employers on the three items mentioned and disagreement in need for further training on the other six skill areas.

Responses to the question of where do former students perceive they learned the most about each skill area indicated that from 52 percent to 78 percent of the former students perceived the Agricultural Mechanics Program at Modesto Junior College to be the place where they learned most about the nine skill areas. The employers' responses comparing

former students with other entry level workers produced an overall mean of 3.45 (computed from Table XVIII), which would indicate an evaluation of "falls in the middle 50 percent." It should be noted in Table XVIII, however, that the mean has been affected by some low scores and that there are a high percentage of the scores in the upper 20 percent category which begins at 3.5.

Student responses on the open-ended items were very favorable. There were several areas where the comments seemed to cluster. These comments are areas where improvement is suggested by more than one student. They are as follow:

1. Articulation with four-year institutions.
2. A need for more training in the supervisory and management skill area.
3. A need for more training in personnel relations.
4. A need for more training in diesel mechanics.
5. A need for a closer relationship between agricultural mechanics instructors and the industry to improve work experience opportunities for students.

Employers were also given the opportunity to respond to open-ended items. There were only three that did so, and these were all favorable responses with no suggestions or criticisms.

Conclusions

Generalizability of this study is limited to existing and future Agricultural Mechanics majors at Modesto Junior College. Generalizability is so restricted because of the limited scope of the geographic area and because of the specialized program that was involved in this

study. This condition could be improved upon by developing and expanding a follow-up system to include all vocational technical students on the Modesto Junior College campus.

The following conclusions were reached after thorough analysis of the data presented in Chapter IV:

1. Former students and employers viewed the importance of the nine skill areas to the job and tended to evaluate former students' competency in the nine skill areas in relatively the same manner. Since there were some of the nine skill areas appearing in the lower ranks in competency but in the higher ranks in importance, there would appear to be a need to re-evaluate the emphasis placed on the various skill areas taught in the Agricultural Mechanics Program at Modesto Junior College.

2. The three most important skill areas as perceived by both employers and former students were personnel relations skills, job practical knowledge, and supervisory or management skills. The fourth skill considered to be most important by the former students was job theoretical knowledge, whereas the employers perceived that power mechanics skills was one of the four most important skill areas.

In competency, former students and employers ranked supervisory or management skills and job theoretical knowledge in the lower four rankings. This further indicates a need to re-evaluate the emphasis placed on these skill areas.

3. The three skill areas perceived by former students and employers to be least important were mathematics skills, related mechanics skills, and clerical skills. Ties in rank for the fourth least important skill, as perceived by the former students was machinery and construction skills and clerical skills. The employers perceived job

theoretical knowledge to be the next least important skill. Clerical skills was considered to be one of the four most important skills by the self-employed group of former students (Appendix C). These facts may indicate a need to re-evaluate the emphasis now placed on these skill areas.

5. Former students perceived a need for further training in each of the nine skill areas, which may influence the number and type of course offerings in the adult evening (extended day) program.

6. A greater percentage of former students perceived a need for further training than did the employers. As indicated by Table XV, at least 50 percent of the employers did, however, indicate a need for more training in all but one of the nine skill areas. This lends further support to the need of expanding the adult evening (extended day) program.

7. Former students' comments included in Appendix D indicate that except for diesel mechanics there appears to be a sufficient amount of agricultural mechanics in the curriculum.

8. It appears that the self-employed group was more confident about the skills since its overall mean score on the self-evaluation was 3.54, compared to 3.208 for the employed group. (Appendix C)

9. The overall mean of 3.54 would appear to indicate that employers believe former students to be in the middle 50 percent when compared to other entry level workers. This could be somewhat deceiving since the self-employed group is not included in this group, and, as can be noted in Table XVIII, there are a high number of students ranked in the upper 20 percent, which starts at 3.5.

10. Even though the continuing education group represented only 19.8 percent of the former students, there appeared to be an articulation problem with the four-year institutions as indicated by former students' comments. This would suggest a need for the Agricultural Mechanics staff to improve upon their articulation agreements with the four-year institutions.

11. A majority of the former students considered Modesto Junior College's Agricultural Mechanics program to be the place where they learned most about the nine skill areas. Since Modesto Junior College is one of the major sources of workers for the community, this is an indication of the importance of the program for providing the community with workers trained in the area of Agricultural Mechanics.

12. From former students' comments there appears to be a need for more work experience opportunity for students. This conclusion would indicate further need for the Agricultural Mechanics staff to become more involved in the community.

13. The 72.7 percent of the employer or self-employed groups of former students that were working in production agriculture, agricultural mechanics off the farm, or related mechanics would tend to indicate that the training received in the Agricultural Mechanics program at Modesto Junior College provides students with sufficient training to become employed in the fields of production agriculture, agricultural mechanics, or related mechanics. The employment distribution further indicated that there are more students returning to the farm than previously recognized and that with only 10.1 percent entering unrelated occupations, it would appear that former students are persistent in their choice of a career involving the use of agricultural mechanics skills.

Recommendations

The following recommendations are based on data obtained during this study, comments made by former students, and the conclusions drawn from analysis of the data presented in Chapter IV.

1. Consideration should be given to placing a greater emphasis on personnel relations skills and supervisory or management skills. Further consideration should be given to a re-evaluation of the emphasis placed on the other skill areas taught in the Agricultural Mechanics program at Modesto Junior College.

2. Inasmuch as most students find it difficult to see the importance of personnel relations skills, supervisory or management skills, clerical skills, and mathematics skills, consideration should be given to orientation materials to emphasize the importance of each to the Agricultural Mechanics program.

3. Consideration should be given to inclusion of more diesel instruction and training into the Power Mechanics Skills area.

4. A better articulation program should be established between four-year institutions and Modesto Junior College's Agricultural Mechanics program.

5. Consideration should be given to improving the existing job placement program for work experience. Agricultural Mechanics staff should be encouraged to improve their relationships with industry in order to improve the work experience program.

6. Consideration should be given to increasing the course offerings in the evening program to include courses which would allow former students to gain further training in the nine skill areas.

7. Steps should be taken to insure the establishment of an effective, continuing follow-up program.

Recommendations for Further Study

To insure the development of a follow-up program for the vocational technical programs at Modesto Junior College, a second follow-up study of all students who are taking Agricultural Mechanics courses should be conducted as soon as possible. This could result in additional information concerning persistance in the Agricultural Mechanics Job Cluster and the transferability of training received. A continuing study of former students is also essential if educational programs are to be effectively developed in the direction that changing technology demands.

BIBLIOGRAPHY

Berdie, R. F.

1954 After High School--What? Minneapolis: University of Minnesota Press.

Carpenter, Earl T., and John H. Rodgers.

1970 Review and Synthesis of Research in Agricultural Education. Research Series No. 59, ERIC Clearing House on Vocational and Technical Education, The Ohio State University, Columbus.

Couvillion, Warren C.

1967 "Educational Levels and Competencies Needed to Fill Existing Jobs in Louisiana Farm Machinery Sales and Service Occupations." (Unpub. M. S. thesis, Louisiana State University.)

Dawes, Robyn M.

1972 Fundamentals of Attitude Measurement. New York: John Wiley and Sons, Inc.

Division of Vocational Education.

1969 A Guide for the Development of Curriculum in Vocational and Technical Education. Los Angeles: University of California Press.

Donald, M. N.

1960 "Implications of Non Response for the Interpretation of Mail Questionnaire Data." Public Opinion Quarterly, Vol. 24, No. 1, 99-114.

Eckland, Bruce K.

1965 "Effects of Prodding to Increase Mail Back Returns." Journal of Applied Psychology, XLIX (June), 165-169.

Field, Ralph R.

1962 The Community College Movement. New York: McGraw Hill.

Fromm, Erich.

1967 Man for Himself. Greenwich, Connecticut: Fawcett Publications, Inc.

Gleaser, Edmond J. (Ed).

1950 A New Social Invention: The Community College. Washington, D.C.: American Association of Junior Colleges.

Good, Carter.

1954 Methods of Research. New York: Appleton-Century-Crofts, Inc.

Hergenreuter, Leonard A.

1966 "Need for Farm Tractor and Machinery Mechanics for the Farm Implement Industry in Colorado." (Unpub. M. S. thesis, Colorado State University.)

Horner, James, and others.

1968 "A Statewide Computerized Model to Determine Occupational Opportunities in Nebraska." Staff Study, Nebraska Research Coordinating Unit for Vocational Education, University of Nebraska, Lincoln.

Johnson, B. Lamar.

1965 "Guidelines and Trends in Post-Secondary Vocational Technical Education." Phi Delta Kappan (April, 1965), 376-380.

Joliet Board of Education.

1950 The Philosophy of Education of the Joliet Township, High School and Junior College. Joliet, Illinois: Joliet Board of Education.

Levine, Sol, and Gerald Gordon.

1958 "Maximizing Returns on Mail Questionnaires." Public Opinion Quarterly, Vol. 22, No. 4, 568-575.

McCorkle, C. L., Jr., and G. W. Dean.

1961 "Projections Relating to California Agriculture in 1975." California Experiment Station Bulletin #778. Davis, California: University of California Press.

McNemar, Quinn.

1946 "Opinion-Attitude Methodology." Psychological Bulletin, XLII (July, 1946), 287-369.

Modesto Junior College Advisory Committee.

1970 Agriculture Department Advisory Committee Report. Modesto, California: Modesto Junior College Agriculture Department (mimeographed).

Monroe, Charles R.

1972 Profile of the Community College. San Francisco: Jossey-Bass, Inc.

Oppenheim, A. N.

1966 Questionnaire Design and Attitude Measurement. New York: Basic Books, Inc.

Parten, Mildred.

1950 Surveys, Polls, and Samples: Practical Procedures. New York: Harper and Row, Publishers.

Penny, Joseph D.

1966 "Analysis of Agricultural Equipment, Chemical and Nursery Business in Lubbock Texas, with Emphasis on Educational Needs." (Unpub. M.S. thesis, Texas Technological College.)

Popham, W. James.

1967 Educational Statistics. New York: Harper and Row, Publishers.

Reynalds, James W.

1969 The Comprehensive Junior College Curriculum. Berkeley, California: McCutchan Publishing Company.

Ruley, M. M., and others.

1970 Vocational and Technical Education. Tulsa, Oklahoma: Vocational and Technical Education, Tulsa Public Schools.

Runyon, Richard, and Audrey Haber.

1967 Fundamentals of Behavioral Statistics. Reading, Massachusetts: Addison-Wesley Publishing Co.

Suchman, E. A., and B. McCandless.

1940 "Who Answers Questionnaires?" Journal of Applied Psychology, XXIV, No. 6 (December, 1940), 758-769.

Thurston, L. L.

1967 Attitude, Theory and Measurement. Martin Fishbein, ed. New York: John Wiley and Sons, Inc.

Ullery, J. William, and Joseph S. Nicastro.

1970 "Development and Evaluation of an Experimental Curriculum for the New Quincy (Mass.) Vocational-Technical School." Project ABLE Final Report, ED 048 492.

U. S. Office of Education.

1968 Between Education and the World of Work. Donald O. Bush, ed. Washington, D.C.: Rockey Mountain Educational Laboratory and U. S. Government Printing Office.

Van Dalen, Deobold.

1962 Understanding Educational Research. New York: McGraw-Hill.

Venn, Grant.

1967 Man, Education and Work. Washington, D.C.: American Council on Education.

Vicars, Joseph Allen.

1972 "A Study of Employer and Employee Opinion Regarding the Adequacy of Training of Vocational-Technical Students at the Texas State Technical Institute." (Unpub. Ed. D. dissertation, Oklahoma State University.)

Wallace, David.

1954 "A Case for and Against Mail Questionnaires." Public Opinion Quarterly, Vol. 18, No. 1, 40-52.

APPENDIXES

APPENDIX A

LETTERS OF TRANSMITTAL AND INSTRUCTION

MODESTO JUNIOR COLLEGE
MODESTO, CALIFORNIA 95350 TELEPHONE 524-1451, AREA 209

February 8, 1973

Dear Sir:

Mr. Stanley Hodges of the Modesto Junior College Agriculture Department is gathering information about job entry preparation from former students of the agricultural mechanics program at M.J.C. and their employers as a part of his doctoral study at Oklahoma State University. It is hoped that this information can be used in giving direction to curriculum development and revision.

The intent of this study is not only to make a contribution to agricultural mechanics in general but particularly to the extent that it enhances the effectiveness of Modesto Junior College and its Agriculture Department in service to its community.

Since we expect this study to be of major importance in helping to establish any changes of direction in our agricultural mechanics program, it is my hope that you will participate in this study by completing the enclosed questionnaire. Your judgment and recommendations will be of significant help to this junior college.

Yours truly,

Henry J. Osner
Dean of Instruction

HJO:lt
enclosure

OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education
(405) 372-6211, Ext. 444

74074

Dear

As you have probably heard, I am attending Oklahoma State University, working on my Doctoral Degree. I have been here since June, 1972. In the course of my study and research, I am attempting to do as much for the Modesto Junior College Agriculture Department as I can. It is for this reason that I am conducting this follow-up study.

I hope to receive enough information, from you and other former Agricultural Mechanics students and your employers, to give us some guide lines with which to evaluate phases of our Agricultural Mechanics Program, and hopefully implement necessary revisions.

Your cooperation in answering the questionnaire, seeing that your employer answers his questionnaire, and then insuring their return to me as soon as possible, will be greatly appreciated. To be of value to us it is imperitive that we hear from all our former students and their employers. Your responses are most important to the validity of the study.

I have attempted to design the questionnaires to take as little of your's and your employer's time as possible. So, please sit down, RIGHT NOW, fill out the questionnaire and drop it in the return mail. It will help considerably, I am sure, if you will take the questionnaire to your employer and encourage him to fill it out.

Do hope this is not too much of an inconvience for you; but at the same time I hope you realize the importance of it to me. I appreciate your help and cooperation very much and hope I can return the favor in the very near future.

Sincerely,

Stan Hodges

Stanley Hodges
Agricultural Education
Oklahoma State University
Stillwater, OK 74074

P.S. Do not forget to take your employer his questionnaire!! If you are self employed, please indicate on the questionnaire where it says "Job Title". THINK - RETURN MAIL!!!

OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education
(405) 372-6211, Ext. 444

74074

March 20, 1973

Dear

I do hope you have not misplaced the questionnaire which I sent to you, for it is very important to my study that I hear from you. If Modesto Junior College Agriculture Department is to make the proper changes in its Agricultural Mechanics program, we must hear from all our former students. Since the best evaluation we can get is from our former students, we would not be getting an accurate picture of the existing program without your response.

This being the case, will you please sit down now and fill out the questionnaire. You could also be of great assistance in encouraging your employer to return his questionnaire as soon as possible.

I do hope that I will be able to return the favor in the not too distant future. Thanking you in advance for your cooperation.

Sincerely,

Stan Hodges.

OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education 74074
(405) 372-6211, Ext. 444

I thought I would try one more time to convince you of the importance of your contribution to my study. It is the feeling of the Modesto Junior College Agriculture Department that, unless we recieve a comment from each of our former students, we have not adequately evaluated the program. Without your response the study will be incomplete. It is important to me, because the validity of my study is dependent upon a high percentage of returns. Just in case you have misplaced the questionnaires, I am enclosing another copy of each. As you take the employer's questionnaire to him, please encourage him to complete and return it as soon as possible.

I would appreciate your immediate cooperation in this matter, as the time allowed for returns is drawing near the end. I expect to hear from you and your employer very soon. Thanking you in advance for your prompt assistance with my study.

Sincerely,

Stan Hodges
Dept. of Agricultural Education
Oklahoma State University
Stillwater, Oklahoma
74074

APPENDIX B

DATA COLLECTION INSTRUMENTS

PREFACE TO DATA COLLECTION INSTRUMENTS

It should be noted that there are additional items on the two questionnaires that were of use to the Agricultural Mechanics Program at Modesto Junior College and their findings will not be treated in this study.

ALL INFORMATION ON THIS QUESTIONNAIRE WILL BE HELD IN STRICT CONFIDENCE AND USED FOR EDUCATIONAL PURPOSES ONLY

Company or Firm _____ Date _____

Address _____

Department or Shop _____

Rating Supervisor _____

Name of Employee _____

Job Title _____

EMPLOYER'S QUESTIONNAIRE

Please give approximate Starting salary

Monthly _____

Hourly _____

For each of the skill areas listed below, answer the questions at the right.

Indicate your answers by marking the appropriate boxes:

	How important is this skill to his present job?					How would you evaluate him on this skill?					How does he compare with other entry workers who have had other training?					Do you feel that he needs more instruction or training in this area?	
	1. Of no real importance	2. Of some importance	3. Of considerable importance	4. Of major importance	5. Of critical importance	1. Needs much improvement	2. Generally below average	3. Average	4. Generally above average	5. Outstanding	1. Falls in the lower 5%	2. Falls in the lower 20%	3. Falls in the middle 50%	4. Falls in the upper 20%	5. Falls in the upper 5%	YES	NO
POWER MECHANICS SKILLS - Refers to those skills necessary for the operation, maintenance, repair, and major overhaul of tractors and machinery.																	
MACHINERY & CONSTRUCTION SKILLS - Refers to those skills necessary to build and repair machinery and farm buildings (welding, electricity, etc.)																	
RELATED MECHANICS SKILLS - Refers to job skills in related areas that help on the job (surveying, soils, irrigation, crops, etc.)																	
JOB PRACTICAL KNOWLEDGE - Refers to practical, everyday, knowledge of work processes, methods, procedures, etc.																	
JOB THEORETICAL KNOWLEDGE - Refers to knowledge of basic principles and concepts underlying the practical trade work.																	
CLERICAL SKILLS - Refers to skill at keeping records, making out reports, and other types of routine paper work.																	
PERSONNEL RELATIONS SKILLS - Refers to skill at dealing with people, such as customers, co-workers, other trades, etc.																	
MATHEMATICAL SKILLS - Refers to ability to use arithmetic or higher mathematics to solve work problems.																	
SUPERVISORY OR MANAGEMENT SKILLS - Refers to skill at supervising others, and managing operations, e.g. instructing, directing, planning, etc.																	
OTHER SKILLS - Add what you feel applies to his job and is not covered above: _____																	

Please make any comments you wish on the reverse side of this questionnaire concerning changes or improvements that you feel would better prepare our students for entry level jobs in agricultural mechanics.

EMPLOYEE'S QUESTIONNAIRE

EOSC PARK Mgt. Prog

Name _____ Date _____
Last First Middle

Name of Employer _____

Address of Employer _____
Street City State Zip Code

Job Title _____

Name of Immediate Supervisor _____

If not employed please indicate status below: (Circle One)

1. Continuing Education
2. Military Service
3. Unemployed
4. Employed part-time only
5. Seeking employment

For each of the skill areas listed below, answer the questions at the right.

Indicate your answers by marking the appropriate boxes.

	How important is this skill for your present job?					How would you evaluate yourself on this skill?					Where did you learn most about this skill?					Do you feel a need for more instruction or training in this area?	
	1. Of no real importance	2. Of some importance	3. Of considerable importance	4. Of major importance	5. Of critical importance	1. Need much improvement	2. Below average	3. Average	4. Above average	5. Outstanding	1. High school	2. Adult evening classes	3. Apprentice program	4. On regular job	5. Elsewhere	YES	NO
POWER MECHANICS SKILLS - Refers to those skills necessary for the operation, maintenance, repair, and major overhaul of tractors and machinery.																	
MACHINERY & CONSTRUCTION SKILLS - Refers to those skills necessary to build and repair machinery and farm buildings (welding, electricity, etc.)																	
RELATED MECHANICS SKILLS - Refers to job skills in related areas that help on the job (surveying, soils, irrigation, crops, etc.)																	
JOB PRACTICAL KNOWLEDGE - Refers to practical, everyday, knowledge of work processes, methods, procedures, etc.																	
JOB THEORETICAL KNOWLEDGE - Refers to knowledge of basic principles and concepts underlying the practical trade work																	
CLERICAL SKILLS - Refers to skill at keeping records, making out reports, and other types of routine paper work.																	
PERSONNEL RELATIONS SKILLS - Refers to skill at dealing with people, such as customers, co-workers, other trades, etc.																	
MATHEMATICAL SKILLS - Refers to ability to use arithmetic or higher mathematics to solve work problems.																	
SUPERVISORY OR MANAGEMENT SKILLS - Refers to skill at supervising others, and managing operations, e.g. instructing, directing, planning, etc.																	
OTHER SKILLS - Add what you feel applies to your job and is not covered above: _____																	

Please give your frank opinion about the following items concerning your education at Modesto Junior College's Agriculture Department:

	Poor	Fair	Satisfactory	Excellent	Outstanding
1. Quality of instruction from shop instructors.					
2. Quality of instruction from other Ag. instructors.					
3. Condition of shop facilities and equipment.					
4. General physical condition of Ag. Dept.					
5. Vocational counseling given to students.					
6. Help given students to find jobs.					
7. Opportunity for extra-curricular activities.					
8. Interest shown by teachers in student problems.					
9. Reputation of Ag. Dept. in the community.					
10. Efforts of Ag. Dept. to stay current(Up to date).					

Please make any comments you wish on the reverse side of this questionnaire concerning changes or improvements you would like to see made in the Modesto Junior College Agricultural Mechanics Program.

APPENDIX C

TABLES OF DATA ON SUB-CATEGORIES OF FORMER STUDENTS

TABLE XIX

EMPLOYED GROUP--DISTRIBUTION OF FORMER STUDENTS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

	How Important Is This Skill for Your Present Job?											
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	19	23.2	16	19.5	16	19.5	15	18.3	16	19.5	2.914	8
Machinery & Construction Skills	13	15.8	13	15.8	20	24.4	11	13.4	25	30.5	3.268	6
Related Mechanics Skills	32	39.0	17	20.7	13	15.8	11	13.4	9	10.9	2.365	9
Job Practical Knowledge	4	4.9	8	9.7	16	19.5	21	25.6	33	40.2	3.866	1
Job Theoretical Knowledge	10	12.2	10	12.2	19	23.1	19	23.1	24	29.3	3.451	4
Clerical Skills	12	14.6	15	18.3	20	24.4	22	26.8	13	15.8	3.109	7
Personnel Relations Skills	6	7.3	9	11.0	12	14.6	20	24.4	35	42.7	3.841	2
Mathematics Skills	6	7.3	19	23.1	19	23.1	19	23.1	19	23.1	3.317	5
Supervisory or Management Skills	8	9.7	14	17.0	13	15.8	23	28.0	24	29.3	3.500	3

TABLE XX

EMPLOYED GROUP--DISTRIBUTION OF FORMER STUDENTS REGARDING THEIR SELF-EVALUATION OF THE NINE SKILL AREAS

	How Would You Evaluate Yourself on This Skill?											
	Needs Much Improvement		Below Average		Average		Above Average		Outstanding			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	2	2.4	6	7.3	43	52.4	28	34.1	3	3.6	3.292	4
Machinery & Construction Skills	0	-	8	9.7	38	46.3	34	41.4	2	2.4	3.365	2.5
Related Mechanics Skills	2	2.4	15	18.3	46	56.0	19	23.1	0	-	3.---	8
Job Practical Knowledge	0	-	6	7.3	35	42.7	40	48.8	1	1.2	3.439	1
Job Theoretical Knowledge	1	1.2	11	13.4	39	47.6	29	35.3	2	2.4	3.243	5
Clerical Skills	4	4.9	13	15.8	36	43.9	29	35.3	0	-	3.097	7
Personnel Relations Skills	0	-	8	9.7	39	47.6	32	39.0	3	3.6	3.365	2.5
Mathematics Skills	5	6.1	15	18.3	46	56.0	16	19.5	0	-	2.890	9
Supervisory or Management Skills	0	-	11	13.4	46	56.0	24	29.3	1	1.2	3.182	6

TABLE XXI

SELF-EMPLOYED GROUP--DISTRIBUTION OF FORMER STUDENTS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

	How Important Is This Skill for Your Present Job?											
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	0	0.0	6	12.0	14	28.0	10	20.0	20	40.0	3.88	6.5
Machinery & Construction Skills	0	0.0	1	2.0	10	20.0	19	38.0	20	40.0	4.16	4
Related Mechanics Skills	2	4.0	7	14.0	6	12.0	16	32.0	19	38.0	3.86	8
Job Practical Knowledge	0	0.0	1	2.0	11	22.0	15	30.0	23	46.0	4.20	2
Job Theoretical Knowledge	1	2.0	2	4.0	18	36.0	19	38.0	10	20.0	3.70	9
Clerical Skills	1	2.0	3	6.0	8	16.0	12	24.0	26	52.0	4.18	3
Personnel Relations Skills	1	2.0	2	4.0	5	10.0	17	34.0	25	50.0	4.26	1
Mathematics Skills	0	0.0	3	6.0	13	26.0	21	42.0	13	26.0	3.88	6.5
Supervisory or Management Skills	0	0.0	6	12.0	10	20.0	14	28.0	20	40.0	3.96	5

TABLE XXII

SELF-EMPLOYED GROUP--DISTRIBUTION OF FORMER STUDENTS REGARDING THEIR SELF-EVALUATION OF THE NINE SKILL AREAS

	How Would You Evaluate Yourself on This Skill?											
	Needs Much Improvement		Below Average		Average		Above Average		Outstanding			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	1	2.0	0	0.0	16	32.0	28	56.0	5	10.0	3.72	3
Machinery & Construction Skills	0	0.0	1	2.0	17	34.0	23	46.0	9	18.0	3.80	1.5
Related Mechanics Skills	1	2.0	3	6.0	22	44.0	18	36.0	6	12.0	3.50	6
Job Practical Knoweldge	0	0.0	0	0.0	15	30.0	30	60.0	5	10.0	3.80	1.5
Job Theoretical Knowledge	1	2.0	4	8.0	28	56.0	14	28.0	3	6.0	3.28	8
Clerical Skills	1	2.0	8	16.0	27	52.0	11	22.0	3	6.0	3.14	9
Personnel Relations Skills	1	2.0	2	4.0	19	38.0	24	48.0	4	8.0	3.56	5
Mathematics Skills	0	0.0	3	6.0	19	38.0	21	42.0	7	14.0	3.64	4
Supervisory or Management Skills	1	2.0	1	2.0	25	50.0	23	46.0	0	0.0	3.40	7

TABLE XXIII

CONTINUING EDUCATION GROUP--DISTRIBUTION OF FORMER STUDENTS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

	How Important Is This Skill for Your Present Job?											
	Of No Real Importance		Of Some Importance		Of Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	4	12.1	3	9.1	5	15.2	6	18.1	15	45.4	3.757	3.5
Machinery & Construction Skills	3	9.1	2	6.0	9	27.3	11	33.3	8	29.2	3.575	6
Related Mechanics Skills	5	15.2	4	12.1	5	15.2	10	30.3	9	27.3	3.420	9
Job Practical Knowledge	0	0.0	4	12.1	9	27.3	13	39.4	7	21.2	3.697	5
Job Theoretical Knowledge	1	3.0	2	6.1	10	30.3	11	33.3	9	27.3	3.757	3.5
Clerical Skills	1	3.0	2	6.1	8	24.2	12	36.7	10	30.3	3.848	2
Personnel Relations Skills	0	0.0	2	6.1	3	9.1	15	45.5	13	39.4	4.180	1
Mathematics Skills	4	12.1	4	12.1	6	18.1	11	33.3	8	24.2	3.454	7
Supervisory or Management Skills	3	9.1	5	15.2	3	9.1	13	39.4	9	27.3	3.424	8

TABLE XXIV

CONTINUING EDUCATION GROUP--DISTRIBUTION OF FORMER STUDENTS REGARDING THEIR SELF-EVALUATION OF THE NINE SKILL AREAS

	How Would You Evaluate Yourself on This Skill?											
	Needs Much Improvement		Below Average		Average		Above Average		Outstanding			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	2	6.1	2	6.1	19	57.5	10	30.3	0	0.0	3.420	1
Machinery & Construction Skills	0	0.0	3	9.1	21	63.6	9	27.3	0	0.0	3.182	2
Related Mechanics Skills	2	6.1	9	27.3	16	48.5	5	15.2	1	3.0	2.818	7
Job Practical Knowledge	1	3.0	2	6.1	23	69.7	7	21.2	0	0.0	3.090	3
Job Theoretical Knowledge	1	3.0	6	18.1	21	63.6	5	15.2	0	0.0	3.030	4.5
Clerical Skills	0	0.0	11	33.3	18	54.5	4	12.1	0	0.0	2.7878	8
Personnel Relations Skills	2	6.1	5	15.2	16	48.5	10	30.3	0	0.0	3.030	4.5
Mathmatics Skills	8	24.2	7	21.2	7	21.2	11	33.3	0	0.0	2.636	9
Supervisory or Management Skills	0	0.0	5	15.2	27	81.8	1	3.0	0	0.0	2.878	6

TABLE XXV

DOUBLE SAMPLE--DISTRIBUTION OF FORMER STUDENTS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

	How Important Is This Skill for Your Present Job?											
	Of No Real Importance		Of Some Importance		Considerable Importance		Of Major Importance		Of Critical Importance			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	1	9.0	4	36.0	1	9.0	2	18.0	3	27.0	3.182	7
Machinery & Construction Skills	1	9.0	2	18.0	3	27.0	3	27.0	2	18.0	3.273	5
Related Mechanics Skills	2	18.0	3	27.0	0	-	3	27.0	3	27.0	3.182	7
Job Practical Knowledge	0	-	0	-	2	18.0	4	36.0	5	45.4	4.273	2
Job Theoretical Knowledge	0	-	1	9.0	4	36.0	4	36.0	2	18.0	3.636	3
Clerical Skills	0	-	2	18.0	5	45.4	2	18.0	2	18.0	3.182	7
Personnel Relations Skills	0	-	0	-	1	9.0	5	45.4	5	45.4	4.364	1
Mathematics Skills	0	-	5	45.4	3	27.0	2	18.0	1	9.0	2.909	9
Supervisory or Management Skills	1	9.0	3	27.0	1	9.0	3	27.0	3	27.0	3.364	4

TABLE XXVI

DOUBLE SAMPLE--DISTRIBUTION OF FORMER STUDENTS REGARDING THEIR SELF-EVALUATION OF THE NINE SKILL AREAS

	How Would You Evaluate Yourself on This Skill?											
	Needs Much Improvement		Below Average		Average		Above Average		Outstanding			
	1		2		3		4		5			
Skill Area	N	%	N	%	N	%	N	%	N	%	Mean Score	Rank Order
Power Mechanics Skills	0	-	1	9.0	4	36.0	6	54.0	0	-	4.000	1
Machinery & Construction Skills	0	-	0	-	7	63.6	4	36.0	0	-	3.364	4
Related Mechanics Skills	0	-	2	18.0	7	63.6	2	18.0	0	-	3.000	8
Job Practical Knowledge	0	-	0	-	6	54.5	5	45.4	0	-	3.455	3
Job Theoretical Knowledge	0	-	1	9.0	6	54.5	4	36.0	0	-	3.273	5
Clerical Skills	1	9.0	2	18.0	3	27.0	5	45.0	0	-	3.091	6.5
Personnel Relations Skills	0	-	0	-	5	45.4	5	45.4	1	9.0	3.636	2
Mathematics Skills	1	9.0	5	45.4	3	27.0	2	18.0	0	-	2.454	9
Supervisory or Management Skills	0	-	2	18.0	6	54.5	3	27.0	0	-	3.091	6.5

APPENDIX D

SELECTED STUDENT COMMENTS

My education at Modesto Junior College was worth the two years in all academic respects.

I feel that Modesto Junior College is one of the best sources of job training around. The instructors at Modesto J. C. are all outstanding in the courses they teach. The amount of equipment has greatly affected my ability to operate different equipment.

As for the Modesto Junior College program, I feel the one year I completed earned my job for me.

As I am concerned about my regular job, I feel that with your help and the help of others at J. C. I was able to secure a position as I did for myself. What I deal with on the job is the thermal insulation of water pipes and air conditioning ducts. As you know, this is all mechanical, so my basic knowledge of mechanics was very helpful. I can truthfully say that probably without this training I would have been unable to land a job of this sort.

We all have to know about paperwork we deal with; but the one thing I liked about the Ag. Dept. was you were able to see the practical side, which I feel today we should strive more for.

I would like to take this time to extend my sincere gratitude to you and the teachers at Modesto Junior College for their devotion to the student and his or her studies. The Modesto Junior College has one of the finest Agriculture Studies Programs in the nation.

My job is not related to agriculture, but my time at Modesto Junior College has helped me in my job a great deal.

One thing I can say for Modesto Junior College is that the teaching staff was very helpful with all my training and classes. The counseling was excellent.

Myself and former Modesto Junior College student, Fred Dean, are operating a backhoe business in the Lake Tahoe-Placerville area. My experience from Modesto Junior College has helped this business a great deal.

I have no changes in mind; but the job you got me with Standard Materials did a good job of keeping my head straight with the business world I know today.

Modesto Junior College Agriculture Department is great for learning how to get any Ag. job done, but people make the world-go-round. I feel the more people that can get jobs like that while still in school will come out with a better understanding of any job.

I am extremely glad that I attended Modesto Junior College and particularly the Agricultural Department. I find that I can work on the repairs of machinery of all types. I am now a fully qualified welder of several different categories. I find that solving problems for foremen, truck operators, builders and soil people is relatively easy thanks to my background from Modesto Junior College.

As a foreigner in college I sort of felt left out of extra-

curricular activities of the Ag. Dept. student body, but I realized the problems of such activities in a Community College.

I'm glad I chose to attend Modesto Junior College. The Agriculture Department teachers not only taught the technical phase but also the practical phase which is the most important.

As I look back, I find my Ag. classes at Junior College were some of the most practical and beneficial I have had during my college education. I always found the Ag. instructors very willing to help anytime I had problems. I think the Ag. program is very well suited in the fact that it prepares students to go out and work after two years. I think that providing students with a practical, workable knowledge is very important as opposed to theory and principles, which tends to cause boredom and lack of interest, considering that most students will go to work after Junior College. However, at the same time, the program at Junior College gave me a sound basis to build on at Cal Poly. One thing that I think is the <u>most important</u> thing for a college education to teach (brainwash) someone is to show them how to apply what they learn and observe and to constantly be looking and reading on new methods, improvements, where to find help. Basically, <u>to be aware of what's happening around them and how it applies to oneself</u>.

I feel there is always room for more instruction. You can never get too much knowledge in the area of your work.

If I had not attended Modesto Junior College Agricultura Department,

I know I would not be where I am today nor as happy doing something else.

My general feelings about the Agriculture Program at Modesto Junior College are very good. I learned more in my two years at Modesto Junior College than I will learn at Fresno. The major point that makes Modesto Junior College so good is that everything that is used is so very practical in applying it to a job or actual farming. I wish I could someday go back to school at Modesto Junior College to get somemore schooling in these basic fields of agriculture. As for improving the Mechanics Department at Modesto Junior College, I would like to see a good diesel engine class started.

I can only say what I've already told Mr. Lea: My three years at Modesto Junior College were three of the wealthiest years of my life. I indicate in my 59 book that I knew many of the hows of farming and I thought I knew many of the whys, but after my second semester at Junior College I realized the little I did know in many aspects.

I'm certainly proud to have attended Modesto Junior College because of these three reasons:

1. I've educated myself to the point of degree where I know many different aspects of farming and management.
2. I've been able to be close in relation to many of the outstanding instructors there.
3. I've become a better understanding person even to fields not pertaining to farming.

Mr. Hodges, I want to say with great honesty that I've greatly

benefited myself from Modesto Junior College, and I want to thank you and instructors like you for giving me that opportunity.

As you've noticed, I am still in the Navy and attached to Coastal River Division Eleven at Mare Island, California. To some people this may not be the best place to be answering your questions, but I feel that Modesto Junior College has helped me very much.

We are required to know hydraulic systems, and electrical systems. These I learned at M.J.C. and through work experience. The only recommendation I have is closer instructor student relations. Overall, I'm very happy with the M.J.C. Ag. Mech. Department and plan to return to it upon my completion of my service obligation.

I hope that you feel free to call on me for anything I can be of help to you, and to Modesto Junior College. I hope you can help others in the future as much as you helped me. It was very nice to know that somebody was interested in my ability, but above all I have to credit this to you and M.J.C. staff for my basic foundation. I think other former students would join me to thank you for your work.

I have gotten a long way from Agriculture working for P.G. & E. but my education at M.J.C. has been very helpful.

The skills I learned in college do not apply to my work, but have helped me very much in my work. By knowing the basic principles of farm machinery I have a good understanding of construction equipment.

I can say that Modesto Junior College does have a very good Ag.

Mechanics Department because they tryed to relate to the students. I personally would not trade what I learned at M.J.C. for all of the money in the world. I feel that there was a will in the teachers to teach the student not just to do their jobs.

The M.J.C. Agricultural Mechanics Program made my progress through Denver Automotive and Diesel College much easier than expected. I have found that a person never quits learning. Regardless of how much he knows.

Although I'm not working in the Ag. Field some of what I was taught in M.J.C. did and has helped me maintain my jobs. It has been mostly the mechanical training that has been of value. Many of the concepts of the Ag. Mech. Program are valid and can be used throughout a lifetime. I feel that the course would be better if it was related to both the more practical side of life and relate it to other jobs.

I feel that it would be meaningful to give a little wider picture about the role of the agricultural mechanics connected to agricultural economics and the whole country. I judge my stay with you as meaningful and it has helped me in my work.

I think M.J.C. has a great Ag. Mech. Dept. although I might make one comment. If possible I feel the advisors should steer the Ag. Mech. students toward getting some of their required courses done, and not lean so heavily on Ag. courses. Not that Ag. classes are not valuable, but problems arise on the higher education level if required courses have not been completed.

I would like to see more classes designed for students planning to transfer to a four year college especially in the soils and water area.

I think that students should be brought up to date on transferring to other colleges and what courses to take.

I continued on to Fresno State College to receive a B S degree in Horticulture in 1970. The biggest problem I have encountered with my education I received while attending M.J.C. was that I ended up taking a lot of courses which I could not use towards graduation. I felt that the student counseling we received at M.J.C. was pitiful.

In the area of counseling I think the M.J.C. Ag. Dept. needs improvement. A number of classes I attended at M.J.C. were not transferable to F.S.C. This means wasted time on the part of the student who is in a hurry to graduate, even though one may have learned something new by taking a class. Time is money and I think all counselors should be totally responsible as to instructing students as to what is, and what is not transferable.

The only thing I found M.J.C. to be lacking in was counseling.

I am at the present time attending Chico State University. The part I would like to comment on is about how classes here at Chico go into much greater detail. About the same time is spent in classes here as at Modesto, but here you must learn more in the same time space. Also, the classes at Modesto, in most cases, do not meet the requirements that the classes here do.

Concerning M.J.C. Ag. Mech. Department, I would like them to try and coordinate their classes with those of State University Ag. Departments.

Modesto Junior College Agri. Mechanics can give students, all students not just transfer students, a real look at how much they do not know. The "related mechanics skills" at J.C. such as you taught are very good and very useful. If anything were to be given more attention it would be basic math, as mechanics students tend to stay away from it when ever they can. More time should also be given to personnel relations as it seems more important everyday, for me at least to be able to work with people whose actions you are responsible for.

The education I received at M.J.C. Ag. Mech. Dept. was satisfactory in every facet. But I needed further Business Management training which I have picked up on the job and with a labor relations class at Fresno City College.

I would like to see more training along the line of extensive management skills such as cost studies, financial management decisions, etc.

A period of time, possibly a semester of concentrated work and study on or in ones major interest or field of study would be desirable. Having only the major field of interest for intense study, learning, and work. Give students a better understanding of Mech. Ag., what it is, what is expected of one. What are the opportunities, test students for

interest and ability. For those who have assets which might be turned toward self employment in Ag. advising to get business management and ag. science related to the areas of potential asset development.

In the last few years I have found that dealing with people is of the utmost importance. I have been in a foreman type capacity which I think is some times harder than being the boss, because you are in the middle and the troups keep testing you. I think Hamblins foreman training class should be mandatory. In my opinion your heading of Job Practical Knowledge can not be stressed too much. Some people do not know how to work.

The program needs some training in time estimation and allowance. How long it takes an average person to complete an assigned job, and how you figure this into a cost breakdown before the job is underway.

I feel that the need for more practical work experience would help me in my job. If we did more lab work on problems and procedures, like engine problems, noises, kickback, carbuerator work, and automatic transmission, even smog devices are getting to be a big problem and no real know how to fix them. Diesel engines are another thing that should have more study on them.

I felt that the college should work closer with people in the community and try to get more student on the job training.

I would like to see better facilities and a larger more spacious shop area to accommodate more equipment to be used in instruction of the classes.

I would like to see a well planned Diesel Engines course. I thought Agricultural Mechanics department excellent on the whole as well as the rest of the Agricultural Department.

More development on the diesel end of things. Since that is what most of the equipment in farming is run by.

I last attended Modesto Junior College in 1969 and at that time I would like to have seen classes added such as an advanced engine and tractor repair class and a class dealing with forage harvesting equipment. Stanislaus County is a dairying county and a class dealing with the equipment with which the dairyman supplies feed for their cows would be both interesting and beneficial.

I feel that the Farm Power class could be expanded into two semesters. The first would cover gasoline powered engines, and the second to cover diesel engines as there are many more of these engines being used. The Fluid Power class should be in two parts. Lecture and lab. This would give more time to work with and repair hydraulic equipment. Introductory Algebra and Trigonometry should be required in the first or second semester. I knew much of this already but most seemed to have a hard time using formulas in various mechanics classes.

As for the curriculum at Modesto Junior College, I would say it has the best foundation of courses of any junior college in California. There are a number of things that I think could be added.

1. In ag. math I think it would be good practice to incorporate the use of slide rule.
2. In irrigation I think some stress should be given to soil mechanics and some information on design and related calculations.
3. In the machinery construction class I think it would be a good idea to set up a formula handout, as you did in the machinery class.

I would like to see a class offered on battery powered equipment such as fork lifts and other lift trucks. I had an opportunity to work on some while at Charmin. I found working on them very interesting but did not have much background on the electrical theory of operation. I feel that a class offered in the Agr. Mech. Dept. would be very beneficial.

The Ag. 59 A, B, C, and D classes somewhat disturbed me in that they were a 1-3 unit class strictly at the discretion of the instructor. Some instructors would give 3 units for very little and others required much to attain full credit for the class. There was not uniformity throughout the Department.

Someplace we need to learn about the importance and ability to follow through on assigned jobs, tasks or responsibilies; especially those assignments considered difficult or undesirable.

VITA ^{v}

Stanley Leon Hodges

Candidate for the Degree of

Doctor of Education

Thesis: EMPLOYEE-EMPLOYER ASSESSMENT OF THE EFFECTIVENESS OF AGRICULTURAL MECHANICS TRAINING RECEIVED AT MODESTO JUNIOR COLLEGE

Major Field: Agricultural Education

Biographical:

Personal Data: Born in Waldport, Oregon, March 29, 1936, the son of Mr. and Mrs. Buster S. Hodges.

Education: Graduated from Delano Joint Union High School, Delano, California, in June, 1954; received the Bachelor of Science degree in Agriculture from Chico State College, in January, 1960; received the Master of Education degree in Agricultural Education from the University of California, Berkeley, in September, 1966; graduate work in Agricultural Mechanics and Agricultural Education taken at University of California, Davis, and California State Polytechnic College, San Luis Obispo, 1967-1971; enrolled in doctoral program at Oklahoma State University, 1972-1973; completed requirements for the Doctor of Education degree at Oklahoma State University in December, 1973.

Professional Experiences: Varied agricultural experience, 1950-1960; Counter Intelligence Agent for the United States Army Counter Intelligence Corps, 1960-1963; high school vocational agricultural instructor at Yuba City High School, Yuba City, California, 1963-1965; Agricultural Mechanics Instructor, Modesto Junior College, 1965-1973.