A STUDY OF EMPLOYER AND EMPLOYEE OPINION REGARDING THE ADEQUACY OF TRAINING OF VOCATIONAL-TECHNICAL STUDENTS AT THE TEXAS STATE TECHNICAL INSTITUTE

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PREFACE

This study could not have been completed without the advice and assistance of many persons. The investigator particularly wishes to express his gratitude to the staff and faculty of The Texas State Technical Institute for their help and assistance.

A special vote of thanks is due his Advisory Committee, Dr. James Key, Dr. Richard Jungers, Dr. Ivan Chapman, Dr. Lloyd Wiggins for their advice and counsel. An extra portion of responsibility fell on the Chairman of the Committee, Dr. Donald S. Phillips, and the investigator particularly wishes to thank him for his assistance.

A note of appreciation is also due Richard and Sue Zimpel for many draft copies and much proof reading, and to Mrs. Anna Gleason for the final copies.

The investigator wishes to dedicate this study to his wife, Roy Ann, and their children, Jim, Mike, Steve, and Jodi without whose support, understanding and sacrifice this program could never have been completed.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

In the United States those responsible for the development of the curriculum for the schools, are aware of the many forces impinging upon the schools. Further, they are aware that our society has challenged not only the types of curricular offerings presented by the school, but the effectiveness of those offerings. Recently there has been a great deal of discussion regarding the concept of accountability in public education. A great deal of doubt has been generated in the minds of many parents, and the public in general, as to the efficiency and effectiveness of our public schools. Arthur W. Forshay states:

> We have, I repeat, to respond to the public doubt. To respond to an anxious public with, 'you never had it so good, educationally,' is no response at all. The question is not, 'Did we ever have it so good?' In fact, there is scarcely any question at all. What exists is a demand--that we make the schools "excellent," and a doubt--that we in education take intellectual excellence seriously. You say, 'How can people have such a doubt?' The point is, the doubt exists. Acting offended--even though this is justified--won't make the doubt go away. We have to act (1).

Statement of the Problem

This demand by the public is extremely broad in nature and when approached as a whole seems almost unanswerable. However, when the demand is subdivided into specific areas it can be more readily approached and dealt with. For the purposes of this study the question under examination will deal with the preparation of post-secondary

vocational-technical students. The public demand that we approach educational excellence seriously can be examined in the light of the adequacy of training provided post secondary vocational-technical students.

One of the major problems encountered while attempting to answer this demand is a lack of empirical information. The information required falls into many categories, such as, types of jobs gained by graduates, skills needed for adequate job performance, skills and knowledges necessary for promotion, level or location where greatest amount of training took place, etc. In addition information is needed regarding changes in the technology base of the various fields of employment. This information is urgently needed by the schools if they are to do an effective job of meeting the needs of the students and the society.

The problem for this study was the lack of specific empirical information regarding the preparation of post-secondary vocational-technical students which could be utilized for the purposes of curriculum revision and development.

Purpose

Those individuals, administrators, teachers, supervisors, curriculum specialists, etc., who are concerned with the development of curriculum and its evaluation, must have a solid base of empirical data upon which they may build new curricular offerings and revise those which are in need of improvement and updating. The purpose for this study was to ascertain the employer and employee attitudes on the adequacy of training received by graduates of The Texas State Technical

Institute located at Waco, Texas, and interpret them for possible use as a curriculum change device.

Objectives of the Study

The objectives for this study were basically threefold. First, to determine the perception of employers and employees as to the importance and adequacy of training in specified areas at The Texas State Technical Institute, Waco Campus. Second, to ascertain the degree of correlation between the employer and employee attitudes. And, finally, to develop from the data obtained, possible curriculum change activities. In order to achieve these objectives, it was necessary to interview both employers and employees by means of a printed questionnaire which required responses to two questions:

1. How important is the skill to the job?
2. Does the employee need additional training in the skill regarding nine categorized areas of curricular offerings?

Research Questions

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

1. How do graduates perceive the importance of the nine skill areas to their job and do they perceive a need for further training?
2. How do employers perceive the importance of the nine skill areas to the job held by their employee and do they perceive a need for further training for that employee?
3. How do employer and employee perceptions of importance of the nine skill areas to the job compare?
4. How do employer and employee perceptions regarding the need for further training for the employee compare?

Need for Study

In order to attain the objectives of the study it was nececcary to evaluate the current offerings of the school. This evaluation provides a part of the basic information required for considered logical changes in the curricular offerings in order to make them more relevant to the students' needs and the needs of the society.

Vocational Education differs slightly from those curricular offerings designated as general education. In Vocational Education it is not sufficient to simply give an individual instruction in a particular area and then test him to determine whether or not he has mastered the material to a sufficient degree to answer the questions found on the final examination. In fact, many curriculum specialists have begun to indicate that it is necessary for those in Vocational Education to go one step further; that step being to follow those students after graduation and ascertain whether or not they have been properly trained for the type of employment they accept. In order to gain this information it is necessary, according to Mager, to go directly to the employer to determine the effectiveness of our vocational program (2). Mager is not alone in his recommendations that we go beyond the school system into the world of work to evaluate the effectiveness of our program. In The American Secondary School Curriculum it is stated:

> Because the employer is the one who has to be satisfied as to whether or not a person is vocationally efficient, he is the logical one to contact to determine the success of a vocational program. Through the use of employer interviews, evaluators can gain insight into the performance of graduates on their jobs. From this, they can ascertain which of the traits are the results of the curriculum of the school (3).

Finally, in the broadest sense, the curriculum has its source in

the interaction of the individual and the world in which he lives. The past, the present and the future are all caught up in this interaction (1).

From this statement, as well as those above, the conclusion can be drawn that it is necessary, if vocational educators are to effectively and objectively evaluate vocational curricular offerings, to go beyond the final examination at the end of the course in order to gain the information necessary to improve and up-date vocational curricular offerings.

Assumptions

This study presumes that the following assumptions are valid.

1. Attitudes exist and can be measured.
2. The respondents who completed the questionnaire were capable of providing responses which were accurate to the best of their knowledge.
3. The instruments for gathering data were sensitive to the research questions under study.

Scope and Limitations

This study was limited to the resources and time span available to the researcher at the time of this study.

Limitation as to Population

The population for this study was limited to the 1970-71 graduates of the James Connally Campus of The Texas State Technical Institute and their employers.

Geographical Area

This study was conducted in the State of Texas.

Limitation of Time

This study was developed and results based on the assessed attitudes of the respondents for the period of November, 1971 through January, 1972 and not for any other time frame.

Definition of Terms

The terms used in this study are in common usage, but, could possibly be misinterpreted. Therefore, it was felt that they should be defined for the purposes of this study.

Manual Job Skills. Refers to skill at using or operating tools, materials, equipment, machines, etc., in the work situation.

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.

Mathematical Skills. Refers to ability to use arithmetic or higher mathematics to solve work problems.

Communication Skills. Refers to skill at speaking, writing, drafting, sketching, etc., to communicate ideas.

Reading and Interpretive Skills. Refers to skill at reading printed matter, blueprints, tables and diagrams.

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

Personal Relations Skills. Refers to skill at dealing with people, such as customers, co-workers, and other tradesmen.

Supervisory Skills. Refers to skill at supervising others, e.g., instructing, directing, evaluation, planning, and organizing.

Attitude Toward Work. Refers to such behavior as absenteeism, rule violation, concern for quality work and cooperation. (4)

Attitude. An emotionalized tendency, organized through experience, to react positively or negatively toward a psychological object. Attitudes are, irrevocably, linked to emotions and may be roughly defined as feeling for or against something.

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

Opinion. A view, judgment, or appraisal formed in the mind about a particular matter. Synonym - view, belief, conviction, persuasion, - a judgment one holds to be true (21). For the purposes of this paper an opinion is held to be the expression of an attitude whether verbal, written, or non-verbal.

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

One-Year Programs. Those programs conducted at The Texas State Technical Institute which encompass three or more trimesters of work, but which do not result in the awarding of a degree upon completion.

Two-Year Programs are those programs conducted at The Texas State Technical Institute which provide for six or more trimesters of work and result in the awarding of the Associate of Applied Science degree upon completion.

Four-Year Programs are those programs conducted at The Texas State Technical Institute consisting of 12 or more trimesters of work and resulting in the awarding of the Bachelor of Technology or Bachelor of Technical Education diplomas upon completion.

CHAPTER II

REVIEW OF LITERATURE

For the purpose of this study, the review of literature is subdivided into four basic sections as follows:

1. Attitude
2. Curriculum Evaluation and Revision
3. Follow-Up
4. Summary

Attitudes and Their Measurement

There are many different definitions for the word "attitude." In fact, the term connotes a concept so nebulous in its abstraction that it would appear to be beneficial if we examined it here.

Thurston (6) defines attitude as "the sum total of man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears and threats, and convictions about any specific topic."

McNemar, in defining attitudes stated:

> 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 existence of which is inferred either from non-verbal overt behavior or verbal and symbolic behavior (7).

A third source, Downie, defines attitudes as:

The readiness to react toward or against some object of

> value. They may be considered as a sort of charge or potential that an individual has. When we are stimulated by the appropriate stimulus our responses usually follow a pre-determined pattern (8).

Quite often an author has a tendency to treat the terms opinion, sentiment, and attitudes as though they refer to basically the same phenomenon. Thurston (6) theorized that an opinion is a verbal expression of an attitude. Unfortunately, it is impossible to see an attitude as a concrete, definable object. However, even though they are not visible, they do, in fact, exist and according to many researchers, they can be measured. For instance, the two most common methods of securing data concerning attitudes are the interview and the questionnaire.

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 (12).

In summary, then, the review of literature concerning attitudes indicates that:

1. Attitudes can be defined within limits.
2. Opinions are considered to be the verbalization aspect of attitudes and can be measured.
3. The questionnaire is considered to be an acceptable method of collecting data about attitudes.

Curriculum Evaluation and Revision

In approaching the question of the educator's role in curriculum evaluation and revision, we might perhaps take the following statement

by Arthur W. Forshay as a starting point:

> In the degree that we take the fundamentals of woodwork to be the care of the tools and the performance of a few simple operations, we have overlooked the technology, the rich old technology, and the art, of woodwork. In the degree that we overlook the technology and the art of metal work, we contribute to the present shocking lack of pride and creativity in the metal shop that foremen consistently complain of. I do not ask that every mechanic become a master machinist. But the slovenly workmanship that is so frequently the object of complaint--the tendency to contrast American and European craftsmen with respect to their pride of workmanship--may be at least in part a product of a too narrow version of what is 'fundamental' to good workmanship as taught in our school shops and other technical classes. The idea seems to me to be at least worth examining. If plumbing is not a discipline, and philosophy is, it does not follow that the plumber should have no knowledge of the technology behind his immediate work. As John Gardner points out, a society which settles for mediocrity in both philosophy and plumbing develops neither theories nor pipes that will hold water (1).

If this is the case, it would seem then that it is up to vocational educators to develop programs of vocational education which will, in fact, produce plumbers whose pipes will hold water. In order to do this, vocational educators must evaluate present curricular offerings in order to determine how they may be improved. Ralph W. Tyler in The American Educational Research Association Monograph Perspectives of Curriculum Evaluation states:

> 'Let's call a spade a spade,' declares a 20th century logical-positivist. What faith in perspicacity! To treat a spade properly we must recognize it as a spade. To specify the impact of an educational program we must be able to perceive impact.
>
> Measurement specialists are proud of their perspicacity. 'If it exists,' they say, 'it exists in quantity; and if it exists in quantity, it can be measured.' It follows that if an educational program has an impact, that impact can be measured. Most specialists in educational testing and measurement believe they can do the job. The general public and most members of the educational profession presume that after having analyzed his data the "testing man" can state in precise terms the worth of a curriculum. The

> language of the Elementary and Secondary Education Act of 1965, Title I, implies that capability to evaluate is presently within our command. But the fluidity of our experiments and the bluntness of our tests deny us that capability. Neither quantity nor quality of impact is measured (9).

Tyler therefore implies that while the capability to evaluate is present educators are failing to do so effectively. One possible method of reaching an acceptable level of evaluative effectiveness is suggested by Robert F. Mager in his book Developing Vocational Instruction. Mager outlines three distinct phases of vocational instruction preparation. These three major phases are as follows: the preparation phase, which consists of:

1. Job description
2. Task analysis
3. Description of the target population
4. Setting the course objectives
5. Determining course pre-requisites
6. A pre-requisite test
7. A criterion examination

Second is the development phase which consists of:

1. Unit outlining
2. Sequencing
3. Content selection
4. Procedure selection
5. Sequence and lesson plan completion
6. Course tryout

To this point, Mager's system differs very little from many other curriculum developers. His third phase, however, is the most important

for the purposes of vocational educators in that it provides a means of following the student after graduation and checking with the employer. This third phase which Mager calls the "improvement phase" is comprised of three divisions:

1. Comparison of performance with objectives.
2. Comparison of objectives with the job.
3. Revision and tryout.

In fact, Mager, in his own words states:

> The professional instructor would no more stop improving his instruction than the professional physician would stop improving his medical skills. Vocations change, new teaching techniques and devices become available, and the average characteristics of the incoming student may gradually shift. It is appropriate, therefore, to set in motion a process guaranteeing that the course will always be as fresh and up-to-date as this morning's newspaper (2).

In preparing the data which is to be derived from any method of collection, educators must be aware that for the data to be usable it must be translated into a form which can be utilized by the teacher. The mere preparation of charts, graphs, and papers expounding upon the conditions found is not sufficient. W. James Popham, in his book, Establishing Instructional Goals, discusses the construction of educational objectives from the material researched in such a manner that all goals shall be stated in terms of observable behavior (10). It is only thus that educators can truly ascertain whether or not the student has achieved the goals set for a particular curricular offering. Further, if these goals are to be realistic, educators must, as Leonard H. Clark says, "go to the employer because the employer is the one who has to be satisfied as to whether or not a person is vocationally efficient" (3). In general, educators judge the success of

our high school graduates by viewing their grades in post-secondary education. For the vocational-technical student, whether he graduates only from high school or from a four-year technical institute or college, this is not sufficient. If he himself does not perceive his training to have been adequate, and his employer does not perceive the training to have been adequate, then the educational system has failed to provide him with the education necessary to a maximmunization of his level of self-realization.

Follow-Up

The concept of follow-up studies is not a new one. Much has been written over the years in Vocational Education Journals of the importance of the follow-up study. Rice states:

> To the extent that adaptation and change do not occur in our educational system as societal needs change, a gap will exist between what is done in education and what is needed.
>
> Follow-up studies can provide pertinent information about motivational factors, assessment of training received and an assessment of performance. Policy makers for Vocational-Technical Education already are being asked for this type of information (11).

One follow-up study conducted by Erwin Turner entitled "A Survey of Employer Opinion of the Adequacy of Trade and Industrial Training in Selected Schools in South Dakota" (1958) dealt with the question of employer satisfaction in regard to the adequacy of training of trade and industrial students in South Dakota. The purposes of the study were to gain information regarding adequacy of skill training, related training and general education. Findings indicated employers were more pleased with the performance of graduates of vocational programs than with the performance of other entry workers who had not had

benefit of vocational training (22).

A second study, Project Able, conducted by the New Quincy, Massachusetts public schools is currently in progress attempting to develop new methods of curriculum design and evaluation. A major part of this study is the follow-up evaluation which will eventually reach both the graduate and his employer. This follow-up and evaluation is currently in progress (4).

Summary

In summary, then an examination of attitudes, opinions and their measure reveal the following: attitudes do exist and they can be measured. The questionnaire is an acceptable method of data collecting. Further, 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 presented in the class. Vocational educators must go beyond the final examination to the ultimate consumer of our educational product, the public--as represented by the employer. This is necessary if vocational educators are to keep vocational education current and effective.

The demand for quality education by the public can be answered in part by the gathering of information about the preparation of students in post-secondary vocational technical schools.

A follow-up of all graduates would be one method of carrying out this extended evaluation of the educational product.

CHAPTER III

METHODOLOGY

The problem for this study was to ascertain employer and employee attitudes on the adequacy of training received by graduates of The Texas State Technical Institute located at Waco, Texas. In order to achieve this stated goal, it was necessary to collect data on a group of graduates and employers of those graduates.

Population

For this study, the population was comprised of all graduates of the Waco Campus of The Texas State Technical Institute for the 1970-71 school year, and those individuals or companies which employed them.

Methodology

In order to carry out this investigation it was decided that because of the large number of persons involved, the vast geographic area to be covered, and the limitations of time, that a mailed questionnaire would be the most effective method of data collection. Good and Scates had this to say about the questionnaire:

> The questionnaire is especially useful in descriptive-survey studies in securing information from widely scattered sources and when it is not practical or feasible to see the respondents personally (12).

In this study, the questionnaire with a cover letter and an enclosed self-addressed stamped return envelope was sent to the graduates

of the James Connally Campus of The Texas State Technical Institute. Non-respondents were mailed a second questionnaire 20 working days later. Fifteen days following the second questionnaire a third questionnaire with cover letter and a self-addressed stamped return envelope was mailed. Graduate returns were examined to ascertain if the respondents were currently employed. For those graduates who indicated that they were currently employed an employer questionnaire was sent to their employer. The same remail schedule was followed with non-responding employers as was used with the graduate portion of the population. Due to limited funds, certified letters and telephone calls were not utilized in this study.

The data, after collection, was organized into subject groups both by employer and employee and submitted to appropriate statistical treatment.

Development of the Questionnaire

Subsequent to the selection of the problem it became necessary to develop a questionnaire which would allow respondents from several job clusters to give responses which could be treated as a group. In order to accomplish this task it was necessary to categorize all job activities into a reasonable number of skill activity areas. During the review of the literature a curriculum development project conducted by the Quincy, Massachusetts Public Schools entitled Project Able was found. This project conducted under a U. S. Office of Education grant dealt with the development of secondary school curriculum for use with disadvantaged youth. As a part of this project an extensive follow-up questionnaire had been developed. In one section of the questionnaire

job skills had been subdivided into nine skill areas. A number of questions were asked regarding these nine skill areas including their importance to the job and if further training was required. It was decided to utilize the nine categories of job skills as defined in the Project Able study as a starting point in the development of the questionnaire for this study.

Following consultation with members of the Oklahoma State Department of Vocational Education Research Coordinating Unit, Dr. James Key, and members of The Texas State Technical Institute staff the present questionnaires were developed. The questionnaires were then submitted to twenty members of The Texas State Technical Institute teaching faculty on an individual basis to determine the suitability of the nine skill areas chosen for use with graduates of a post-secondary Technical Institute. These faculty members possessed from one to more than twenty years teaching experience and from three to more than fifteen years of industrial experience. All had been engaged in some form of industrial experience during the last five years. These twenty faculty members concurred in the selection of the nine skill items as being appropriate for use in the questionnaire. They also indicated that the two questions: "How important is the skill to the job?" and "Is there a need for further training?" would provide information that would be useful to them in developing future curriculum.

Following this development and piloting process the questionnaires were printed and mailed out.

The questionnaire utilized nine skill areas as follows (4):

1. Manual job skills
2. Job practical knowledge

3. Job theoretical knowledge
4. Mathematical skills
5. Communication skills
6. Reading and interpretive skills
7. Clerical skills
8. Personal relations skills
9. Supervisory skills

Three variables are rated across three, five point Likert Type Scales (17). For the employer, (1) concerns the importance of the skill for the job, (2) evaluating the employee on the skill, and (3) rating him in comparison to other employees with the same amount of time on the job.

For the employee, the three Likert Type Scales involve (1) the importance of the skill to the job, (2) the amount of skill learned at TSTI, and (3) where the greatest amount of this particular skill was learned. In addition, both the employer and the employee are asked to indicate whether or not they feel the employee needs further training in each of the areas.

The employee is asked to rate specific aspects of his training at TSTI across an additional five point Likert Type Scale. A final open-ended item is included on each questionnaire to allow the respondent to make any comments he feels are pertinent.

Variables 2 and 3 for both the employer and the employee were included in the questionnaire together with certain other items for use by The Texas State Technical Institute and will not be reported or dealt with in this study.

Included in the appendix are a list of the programs offered by

The Texas State Technical Institute which had graduates during the 1970-71 academic year and a list of their programs having graduates included in the respondent group.

Statistical Procedure

Frequency distributions and percentages are given on data collected. In the case of the item of importance of skill to the job, the employer and employee perceptions were correlated using the Pearson Product Moment Correlation Coefficient and the relative importance of the nine skills was compared utilizing The Kendall's Coefficient of Concordance.

The Pearson r represents the extent to which the same individuals or events are related to a value scale. The raw score computational formula is:

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

The steps for computation of the Pearson r are:

1. List all x values and paired y values.
2. Sum all x and y values.
3. Square all x and y values.
4. List the cross products of all x and y pairs.
5. Sum all xy product values.
6. Place values derived in formula.

The primary assumptions for the Pearson r are (1) that the relationship is linear, (2) that an essentially normal distribution exists and (3) that the data reaches at least interval level (18).

In order to clarify the comparison of employee and employer perceptions in regard to the importance of the skill to the job the Kendall's Coefficient of Concordance was utilized to compare the rank order of the skills by the two groups.

The Kendall's Coefficient of Condordance is used to measure the degree of agreement among a number (k) of independent rankings of a set of N objects or individuals.

The computer program utilized, calculated the Coefficient of Concordance, W. In addition the program calculated a chi-square to show the significance of the calculated W. The null hypothesis posited by the chi-square is that the two groups are unrelated. The computational formula for the Kendall's Coefficient of Concordance, W, is as follows:

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

where s = sum of squares of the observed deviations from the mean of R_j, that is, $s = \sum \left(R_j - \frac{\sum R_j}{N} \right)^2$

k = number of sets of rankings, e.g., the number of judges.

N = number of entities (objects or individuals) ranked.

$\frac{1}{12} k^2 (N^3 - N)$ = maximum possible sum of the squared deviations, i.e., the sum s which would occur with perfect agreement among k rankings (20).

The correction for ties is:

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

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

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

Procedure 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 that mean. Square these deviations, and sum the squares to obtain s.
4. The method for determining whether the observed values of W is significantly different from zero depends on the size of N:
   a. If N is 7 or smaller, Table R gives critical value of s associated with W's significant at the .05 and .01 levels.
   b. If N is larger than 7, either formula (9.17) or formula (9.18)(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 (20).

The null hypothesis stated for the chi-square used to test the significance of W is that the rankings of graduates and their employers are unrelated. Attainment of a significant value indicates that at that level they are related.

In answering the question do employers and their employee perceive the need for additional training in essentially the same manner, the Chi-square technique was chosen. The null hypothesis set forth was that there was no statistically significant difference in the perception of the two groups. The .05 level of significance was chosen.

This indicates that a value for Chi-square which exceeds the significant value for a 2 x 2 table with one degree of freedom is 3.84.

The computational formula for chi=square given by Popham is:

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

When calculated from a 2 x 2 table the Yates correction is applied causing the formula to appear as follows:

$$X^2 = \frac{\left| (\text{Observed frequencies} - \text{Expected frequencies} \right| - .05)^2}{\text{Expected frequencies}}$$

Chi-square in this case is used to test the difference between two samples.

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 four research questions stated in Chapter I. Three statistical treatments were utilized to evaluate the data, the Pearson Product Moment Correlation Coefficient, the Chi-square test and the Kendall's Coefficient of Concordance. The Kendall's W was utilized to show the amount of agreement between employer and employee perception of the relative importance of the nine skill areas to the job.

A mail questionnaire was developed in two forms, one for the graduate of The Texas State Technical Institute, the second for his employer. The nine skill areas examined for importance to the job and need for additional training are common to both forms. Additional items were included for use by The Texas State Technical Institute. Copies of the questionnaires are included in Appendix B.

Examination of the returns provided data regarding the research questions stated in Chapter I. The last item on the questionnaire was an open-end item which allowed the respondent to expand upon the responses made earlier in the questionnaire if he so desired. The data will be presented in three sections. First, a description of the population and the return. Second, discussion of the four research questions and third, a summary of the employer and employee comments.

Description of Population and Return

The population for this study was comprised of the 1970-71 graduates of the James Connally Campus of The Texas State Technical Institute and the employers of those indicating that they were employed. Table I shows the distribution of the graduate population and return.

TABLE I

DISTRIBUTION OF GRADUATE POPULATION AND RETURN

	Population N = 403	%	Return N = 251	%
One-year graduates	227	56	148	59
Two-year graduates	156	39	92	37
Four-year graduates	20	5	11	4
Total	403		251	62% return

The graduate portion of the population consisted of 403 graduates of the James Connally Campus of The Texas State Technical Institute for the school year of 1970-71. This group was made up of 227 graduates (56%) of one-year programs, 156 graduates (39%) of two-year programs and 20 graduates (5%) of four-year programs. The graduate return of 251 contained 148 graduates (59%) of one-year programs, 92 graduates (37%) of two-year programs, and 11 graduates (4%) of four-year programs. The close similarity of the breakdown of the population and

return is an indication that the return is not unduly biased by the disproportional return of any one group and is representative of the population.

Table II shows the distribution of the graduate return in regard to current status of the graduates, i.e., employed, unemployed, continuing education, or in military service.

TABLE II

CURRENT STATUS OF GRADUATES

	One-Year Program N = 148	%	Two-Year Programs N = 92	%	Four-Year Programs N = 11	%
Employed	93	63	64	70	8	77
Continuing Education	35	24	19	21		
Military Service	14	9	7	7	3	23
Unemployed	6	4	2			
Total	148		92		11	

An examination of the data presented in Table II indicates that sixty-three per cent of the one-year program graduates are employed, seventy per cent of the two-year program graduates are employed, and seventy-five per cent of the four-year graduates are employed. This indicates a slight rise in the percentage of employment at each level of additional preparation.

One hundred fifty-seven graduates comprising 91 per cent of the

total employed group indicated that they were working in areas related to their preparation. Five graduates comprising three per cent of the total employed group indicated that they were working in areas not related to their preparation. Of these five graduates four were one-year graduates, the other one was the graduate of a two-year program.

Nine per cent of the graduates entered the military service. This nine per cent represents 23 persons. Fourteen were graduates of one-year programs, six were graduates of two-year programs and three were graduates of four-year programs.

Twenty-two per cent of the graduates continued their education. This group is composed of 35 graduates of one-year programs and 19 graduates of two-year programs. The one and two-year program percentages were 23% and 21%, respectively, showing that both groups move approximately at the same level of persistence in acquiring new skills and training.

Research Questions

Research Question 1.

How do graduates perceive the importance of the nine skill areas to their work and do they perceive a need for further training in the nine skill areas?

Responses to this question were treated two ways. First by reviewing the number of responses made by graduates in regard to each of the nine skill areas across the five point Likert type scale employed. This was done both by number of individuals giving a specific response and by percentage of the total response to that particular skill area. Second, the means of all responses were computed and the

nine skill areas rank ordered in descending order of perceived importance of skill to the job. Tables III and V show the number of responses for each category, the mean percentage of the total response to each skill area, the mean score for each skill area, and its rank order of importance to the job.

Table IV shows perceptions by graduates of one-year programs regarding the need for additional training in each of the nine skill areas.

For the purpose of discussion in order to show direction the first two categories of response, "Of No Real Importance" and "Of Some Importance," were collapsed into a single category of less than average importance. The middle response of "Considerable Importance" will be referred to as of "Average Importance" and the two upper categories of response, "Of Major Importance" and "Of Critical Importance" were collapsed into a single category of "Above Average Importance."

Responses of graduates of one-year programs will be given first followed by responses of graduates of two-year programs. Responses made by graduates of four-year programs will be presented last.

Responses by Graduates of One-Year Programs. In the area of Manual Job Skills 10 graduates (12%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 19 graduates (20%) and 64 graduates (68%) indicated a perception of above average importance to the job. The mean score derived was 3.85. Manual Job Skills were ranked second in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 59 graduates (63%) indicated that they perceived a need for further training while 34 gradu-

TABLE III

DISTRIBUTION OF PERCEPTIONS OF GRADUATES OF ONE-YEAR PROGRAMS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

Skill Area	How Important Is This Skill To Your Job?										Mean Score	Rank Order
	No Real Importance 1		Of Some Importance 2		Of Considerable Importance 3		Of Major Importance 4		Of Critical Importance 5			
	N	%	N	%	N	%	N	%	N	%		
Manual Job Skills	3	4	7	8	19	20	36	39	28	29	3.85	2
Job Practical Knowledge	2	2	7	8	19	20	39	42	26	26	3.96	1
Job Theoretical Knowledge	4	5	11	12	21	22	39	42	19	19	3.76	3
Mathematical Skills	10	11	34	37	30	32	8	9	11	11	2.74	7
Communication Skills	8	9	30	32	20	21	17	18	18	20	3.08	5.5
Reading & Interpretive Skills	10	11	23	25	27	29	16	17	17	18	3.08	5.5
Clerical Skills	22	24	27	29	25	27	8	9	11	11	2.56	9
Personal Relations Skills	3	3	13	14	26	28	25	27	26	28	3.62	4
Supervisory Skills	19	20	27	29	25	27	10	11	12	13	2.67	8

ates (37%) indicated that they did not perceive a need for further training.

In the area of Job Practical Knowledge nine graduates (10%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 19 graduates (20%) and 65 graduates (68%) indicated a perception of above average importance to the job. The mean score derived was 3.97. Job Practical Knowledge was ranked first in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 66 graduates (71%) indicated that they perceived a need for further training while 27 graduates (29%) indicated that they did not perceive a need for further training.

TABLE IV

PERCEPTIONS OF ONE-YEAR GRADUATES IN REGARD TO NEED FOR FURTHER TRAINING

Skill Area	Further Training Required			
	Yes		No	
	N	%	N	%
Manual Job Skills	59	63	34	37
Job Practical Knowledge	66	71	27	29
Job Theoretical Knowledge	59	63	34	37
Mathematical Skills	44	47	49	53
Communication Skills	54	58	37	42
Reading & Interpretative Skills	55	59	38	41
Clerical Skills	52	56	41	44
Personal Relations Skills	55	59	38	41
Supervisory Skills	66	71	27	29

In the area of Job Theoretical Knowledge 15 graduates (17%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 21 graduates (22%) and 58 graduates (61%) indicated a perception of above average importance to the job. The mean score derived was 3.76. Job Theoretical Knowledge was ranked third in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 59 graduates (63%) indicated that they perceived a need for further training while 34 graduates (37%) indicated that they did not perceive a need for further training.

In the area of Mathematical Skills 44 graduates (48%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 30 graduates (32%) and 19 graduates (20%) indicated a perception of above average importance to the job. The mean score derived was 2.74. Mathematical Skills were ranked seventh in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 44 graduates (47%) indicated that they perceived a need for further training while 49 (53%) indicated that they did not perceive a need for further training.

In the area of Communication Skills 38 graduates (41%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 20 graduates (21%) and 35 graduates (38%) indicated a perception of above average importance to the job. The mean score dericed was 3.07. Communication skills were ranked five and one-half in order of importance to the job. In regard to the questions, "Do you need further training in

this skill?", 54 graduates (58%) indicated that they perceived a need for further training while 39 graduates (42%) indicated that they did not perceive a need for further training.

In the area of Reading and Interpretive Skills 33 graduates (36%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 27 graduates (29%) and 33 graduates (36%) indicated a perception of above average importance to the job. The mean score derived was 3.07. Reading and Interpretive Skills were ranked five and one-half in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 55 graduates (59%) indicated that they perceived a need for further training.

In the area of Clerical Skills 49 graduates (53%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 25 graduates (27%) and 19 graduates (20%) indicated a perception of above average importance to the job. The mean score derived was 2.56. Clerical Skills were ranked ninth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 52 graduates (56%) indicated that they perceived a need for further training while 41 graduates (44%) indicated that they did not perceive a need for further training.

In the area of Personal Relations Skills 16 graduates (17%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 26 graduates (28%) and 51 graduates (55%) indicated a perception of above average importance to the job. The mean score derived was 3.62. Personal

Relations Skills ranked fourth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 55 graduates, (59%) indicated that they perceived a need for further training while 38 graduates (41%) indicated that they did not perceive a need for further training.

In the area of Supervisory Skills 46 graduates (49%) indicated a perception of less than average importance to the job was indicated by 25 graduates (27%) and 22 graduates (24%) indicated a perception of above average importance to the job. The mean score derived was 2.67. Supervisory Skills were ranked eighth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 66 graduates (71%) indicated that they perceived a need for further training while 27 graduates (29%) indicated that they did not perceive a need for further training.

Responses by Graduates of Two-Year Programs. In the area of Manual Job Skills 16 graduates (28%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 17 graduates (28%) and 28 graduates (44%) indicated a perception of above average importance to the job. The mean score derived was 3.28. Manual Job Skills were ranked fourth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 39 graduates (64%) indicated that they perceived a need for further training while 22 graduates (36%) indicated that they did not perceive a need for further training.

In the area of Job Practical Knowledge eight graduates (14%) indicated a perception of less than average importance to the job.

TABLE V

DISTRIBUTION OF PERCEPTIONS OF GRADUATES OF TWO-YEAR PROGRAMS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

Skill Area	How Important Is This Skill To Your Job?										Mean Score	Rank Order
	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	%		
Manual Job Skills	8	14	8	14	17	28	15	25	13	22	3.28	4
Job Practical Knowledge	3	4	4	7	11	18	20	33	23	38	3.92	1
Job Theoretical Knowledge	4	7	9	15	11	18	19	32	18	28	3.62	2
Mathematical Skills	7	12	24	40	13	22	10	14	7	12	2.77	8
Communication Skills	9	15	14	23	15	25	12	19	11	18	3.20	6
Reading & Interpretive Skills	9	15	10	17	13	22	17	26	12	20	3.21	5
Clerical Skills	16	27	20	33	12	20	10	16	3	4	2.41	9
Personal Relations Skills	3	4	9	15	13	22	23	37	13	22	3.56	3
Supervisory Skills	10	17	18	28	12	20	10	17	11	18	2.90	7

A perception of average importance to the job was indicated by 11 graduates (18%) and 43 graduates (71%) indicated a perception of above average importance to the job. The mean score derived was 3.92. Job Practical Knowledge was ranked first in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 39 graduates (64%) indicated that they perceived a need for further training while 22 graduates (36%) indicated that they did not perceive a need for further training.

In the area of Job Theoretical Knowledge 15 graduates (22%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 11 graduates (18%) and 37 graduates (60%) indicated a perception of above average importance to the job. The mean score derived was 3.62. Job Theoretical Knowledge was ranked second in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 25 graduates (41%) indicated that they perceived a need for further training while 36 graduates (59%) indicated that they did not perceive a need for further training.

In the area of Mathematical Skills 31 graduates (52%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 13 graduates (22%) and 17 graduates (28%) indicated a perception of above average importance to the job. The mean score derived was 2.77. Mathematical Skills were ranked eighth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 26 graduates (43%) indicated that they perceived a need for further training while 35 graduates (57%) indicated that they did not perceive

a need for further training.

TABLE VI

PERCEPTIONS OF TWO-YEAR GRADUATES IN REGARD TO NEED FOR FURTHER TRAINING

Skill area	Further Training Required			
	Yes		No	
	N	%	N	%
Manual Job Skills	39	64	22	36
Job Practical Knowledge	39	64	22	36
Job Theoretical Knowledge	25	41	36	59
Mathematical Skills	26	43	35	57
Communication Skills	39	64	22	36
Reading & Interpretive Skills	33	54	28	46
Clerical Skills	25	41	36	59
Personal Relations Skills	32	52	29	48
Supervisory Skills	37	61	24	39

In the area of Communication Skills 25 graduates (38%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 15 graduates (25%) and 23 graduates (37%) indicated a perception of above average importance to the job. The mean score derived was 3.19. Communication Skills were ranked sixth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 33 graduates (64%) indicated that they perceived a need for further training while 22 graduates (36%) indicated that they did not perceive a

need for further training.

In the area of Reading and Interpretive Skills 19 graduates (32%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 13 graduates (22%) and 29 graduates (48%) indicated a perception of above average importance to the job. The mean score derived was 3.21. Reading and Interpretive Skills were ranked fifth in order of importance to the job. In regard to the questions, "Do you need further training in this skill?", 33 graduates (54%) indicated that they perceived a need for further training while 28 graduates (47%) indicated that they did not perceive a need for further training.

In the area of Clerical Skills 36 graduates (60%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 12 graduates (20%) and 13 graduates (20%) indicated a perception of above average importance to the job. The mean score derived was 2.41. Clerical Skills were ranked ninth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", 25 graduates (41%) indicated that they perceived a need for further training while 36 graduates (59%) indicated that they did not perceive a need for further training.

In the area of Personal Relations Skills 12 graduates (19%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 13 graduates (20%) and 36 graduates (61%) indicated a perception of above average importance to the job. The mean score derived was 3.56. Personal Relations Skills were ranked third in order of importance to the

job. In regard to the question, "Do you need further training in this skill?", 32 graduates (52%) indicated that they perceived a need for further training while 29 graduates (48%) indicated that they did not perceive a need for further training.

In the area of Supervisory Skills 28 graduates (44%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 12 graduates (19%) and 21 graduates (37%) indicated a perception of above average importance to the job. The mean score derived was 2.90. Supervisory Skills were ranked seventh in order of importance to the job. In regard to the question "Do you need further training in this skill?", 37 graduates (61%) indicated that they perceived a need for further training while 24 graduates (39%) indicated that they did not perceive a need for further training.

Responses by Graduates of Four-Year Programs. In the area of Manual Job Skills one graduate (12%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by four graduates (50%) and three graduates (38%) indicated a perception of above average importance to the job. The mean score derived was 3.25. Manual Job Skills were ranked eighth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", one graduate (12%) indicated that he perceived a need for further training while seven graduates (88%) indicated that they did not perceive a need for further training.

In the area of Job Practical Knowledge none indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by two graduates and six graduates

TABLE VII

DISTRIBUTION OF PERCEPTIONS OF GRADUATES OF FOUR-YEAR PROGRAMS REGARDING THE IMPORTANCE OF THE NINE SKILL AREAS TO THE JOB

Skill Area	How Important Is This Skill To Your Job?										Mean Score	Rank Order
	No Real Importance 1		Of Some Importance 2		Of Considerable Importance 3		Of Major Importance 4		Of Critical Importance 5			
	N	%	N	%	N	%	N	%	N	%		
Manual Job Skills	1	12			4	50	2	25	1	13	3.25	8
Job Practical Knowledge					2	25	3	37	3	38	4.13	3.5
Job Theoretical Knowledge					3	37			5	63	4.25	2
Mathematical Skills			3	37	3	38			2	25	3.13	9
Communication Skills			2	25			2	25	4	50	4.00	5
Reading & Interpretive Skills					1	13	5	62	2	25	4.13	3.5
Clerical Skills			1	12	3	38	1	12	3	38	3.75	6.5
Personal Relations Skills							4	50	4	50	4.50	1
Supervisory Skills	1	12	1	12	1	12	1	13	4	50	3.75	6.5

indicated a perception of above average importance to the job. The mean score derived was 4.13. Job Practical Knowledge was ranked three and one half in order of importance to the job. In regard to the question "Do you need further training in this skill?", five graduates (63%) indicated that they perceived a need for further training while three graduates (37%) indicated that they did not perceive a need for further training.

TABLE VIII

PERCEPTIONS OF FOUR-YEAR GRADUATES IN REGARD TO NEED FOR FURTHER TRAINING

	Further Training Required			
	Yes		No	
Skill Areas	N	%	N	%
Manual Job Skills	1	12	7	88
Job Practical Knowledge	5	63	3	37
Job Theoretical Knowledge	7	88	1	12
Mathematical Skills	4	50	4	50
Communication Skills	4	50	4	50
Reading & Interpretive Skills	7	88	1	12
Clerical Skills	3	37	5	63
Personal Relations Skills	5	63	3	37
Supervisory Skills	7	88	1	12

In the area of Job Theoretical Knowledge none indicated a perception of less than average importance to the job. A perception of aver-

age importance to the job was indicated by three graduates (37%) and fice graduates (63%) indicated a perception of above average importance to the job. The mean score derived was 4.25. Job Theoretical knowledge was ranked second in order of importance to the job. In regard to the question. "Do you need further training in this skill?", seven graduates (88%) indicated that they perceived a need for further training while one student (12%) indicated that he did not perceive a need for further training.

In the area of Mathematical Skills three graduates (37%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by three graduates (38%) and two graduates (25%) indicated a perception of above average importance to the job. The mean score derived was 3.13. Mathematical Skills ranked ninth in order of importance to the job. In regard to the question,"Do you need further training in this skill?", seven graduates (88%) indicated that they perceived a need for further training while one graduate (12%) indicated that he did not perceive a need for further training.

In the area of Communication Skills two graduates (25%) indicated a perception of less than average importance to the job. No one indicated a perception of average importance to the job. The mean score derived was 4.00. Communication Skills was ranked fifth in order of importance to the job. In regard to the question, "Do you need further training in this skill?", four graduates (50%) indicated that they perceived a need for further training while four graduates (50%) indicated that they did not perceive a need for further training.

In the area of Reading and Interpretive Skills no one indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by one graduate (12%) and seven graduates (88%) indicated a perception of above average importance to the job. The mean score derived was 4.13. Reading and Interpretive Skills was ranked three and one-half in order of importance to the job. In regard to the question, "Do you need further training in this skill?", seven graduates (88%) indicated that they perceived a need for further training while one graduate (12%) indicated that he did not perceive a need for further training.

In the area of Clerical Skills one student (12%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by three graduates (38%) and four graduates (50%) indicated a perception of above average importance to the job. The mean score derived was 3.75. Clerical Skills was ranked six and one-half in order of importance to the job. In regard to the question, "Do you need further training in this skill?", three graduates (37%) indicated that they perceived a need for further training while five graduates (63%) indicated that they did not perceive a need for further training.

In the area of Personal Relations Skills no one indicated a perception of less than average importance to the job. A perception of average importance was not indicated by anyone, and eight graduates (100%) indicated a perception of above average importance to the job. The mean score derived was 4.50. Personal Relations Skill was ranked first in the order of importance to the job. In regard to the question, "Do you need further training in this skill?", five graduates (63%)

indicated that they perceived a need for further training while three graduates (37%) indicated that they did not perceive a need for further training.

In the area of Supervisory Skills two graduates (25) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by one graduate (12%) and five graduates (63%) indicated a perception of above average importance to the job. The mean score derived was 3.75. Supervisory Skills was ranked six and one-half in order of importance to the job. In regard to the question, "Do you need further training in this skill?", seven graduates (88%) indicated that they perceived a need for further training while one graduate (12%) indicated that he did not perceive a need for further training.

Graduate returns were examined upon receipt to ascertain if the graduates were employed. For those graduates indicating that they were employed a questionnaire was mailed to their employers. A total of 102 employers (63%) replied to the questionnaire. Of those, 61 (60%) were employers of graduates of one-year programs, 39 (38%) were employers of graduates of two-year programs and two (2%) were employers of graduates of four-year programs.

Research Question 2.

How do employers perceive the importance of the nine skill areas to the job and do they perceive a need for further training in the nine skill areas?

TABLE IX

DISTRIBUTION OF EMPLOYER POPULATION AND RETURN

	Population N = 162	%	Return N = 102	%
Employers of Graduates of One-Year Programs	93	57	61	60
Employers of Graduates of Two-Year Programs	61	38	39	38
Employers of Graduates of Four-Year Programs	8	5	2	2
Total	162		102	
Total Return 63%				

Responses to this question were examined two ways. First, by reviewing the number of responses made by employers in regard to each of the nine skill areas across the five point Likert type scale employed. This was done both by number of individuals giving a specific response and by percentage of the total response to that particular skill area. Second, the means of all responses were computed and the nine skill areas rank ordered in descending order of perceived importance of the skill to the job. Tables VII IX and XI show the number of responses for each category, the percentage of the total response to each skill area, the mean score for each skill area and its rank order of importance to the job. Tables X and XII show perceptions by employers regarding the need for further training in each of the nine skill areas.

For the purposes of discussion in order to show direction the

first two categories of response, Of No Importance and Of Some Importance, were collapsed into a single category of less than average importance. The middle response Of Considerable Importance will be referred to as of average importance and the two upper categories of response, Of Major Importance and Of Critical Importance, were collapsed into a single category of above average importance.

Responses by employers of graduates of one-year programs will be given first followed by responses of employers of graduates of two-year programs. Responses by employers of graduates of four-year programs were not included due to the small number of returns. (N - 2).

Responses Made by Employers of Graduates of One-Year Programs. In the area of Manual Job Skills three employers (5%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by eight employers (13%) and 50 employers (82%) indicated a perception of above importance to the job. The mean score derived was 4.15. Manual Job Skills were ranked first in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 39 employers (64%) indicated that they perceived a need for further training while 22 employers (36%) indicated that they did not perceive a need for further training.

In the area of Job Practical Knowledge four employers (7%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by seven employers (11%) and 50 employers (82%) indicated a perception of above average importance to the job. The mean score derived was 4.07. Job Practical Knowledge was ranked second in order of importance to the

TABLE X

DISTRIBUTION OF PERCEPTIONS BY EMPLOYERS OF GRADUATES OF ONE-YEAR PROGRAMS IN REGARD TO IMPORTANCE OF THE NINE SKILLS TO THE JOB

Skill Area	How Important Is This Skill To His Job?										Mean Score	Rank Order
	No Real Importance 1		Of Some Importance 2		Of Considerable Importance 3		Of Major Importance 4		Of Critical Importance 5			
	N	%	N	%	N	%	N	%	N	%		
Manual Job Skills	1	2	2	3	8	13	26	43	24	39	4.15	1
Job Practical Knowledge	1	2	3	5	7	11	30	49	20	33	4.07	2
Job Theoretical Knowledge	1	2			20	33	30	49	10	16	3.60	4
Mathematical Skills	13	21	14	23	21	34	12	20	1	2	2.57	9
Communication Skills	10	16	6	10	19	31	25	41	1	2	3.02	6
Reading & Interpretive Skills	4	7	4	7	28	46	21	34	4	6	3.28	5
Clerical Skills	9	15	7	11	24	39	18	30	3	5	2.59	8
Personal Relations Skills	1	2	5	8	16	26	20	33	19	31	3.84	3
Supervisory Skills	7	11	18	30	16	26	11	18	9	15	2.95	7

job. In regard to the question, "Do you feel these graduates need further training in this skill?", 38 employers (62%) indicated that they perceived a need for further training while 23 employers (38%) indicated that they did not perceive a need for further training.

In the area of Job Theoretical Knowledge one employer (2%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 20 employers (33%) and 40 employers (65%) indicated a perception of above average importance to the job. The mean score derived was 3.60. Job Theoretical Knowledge was ranked fourth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 40 employers (66%) indicated that they perceived a need for further training while 21 employers (34%) indicated that they did not perceive need for further training.

In the area of Mathematical Skills 27 employers (44%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 21 employers (34%) and 13 employers (22%) indicated a perception of above average importance to the job. The mean score derived was 2.57. Mathematical Skills were ranked ninth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 33 employers (54%) indicated that they perceived a need for further training while 28 employers (46%) indicated that they did not perceive a need for further training.

In the area of Communication Skills 16 employers (26%) indicated a perception of less than average importance to the job. A perception of average importance to job was indicated by 19 employers (31%) and

TABLE XI

PERCEPTIONS OF EMPLOYERS OF GRADUATES OF ONE-YEAR PROGRAMS REGARDING THE NEED FOR FURTHER TRAINING

	Does He Need Further Training in This Skill?			
Skill Area	Yes		No	
	N	%	N	%
Manual Job Skills	39	64	22	36
Job Practical Knowledge	38	62	23	38
Job Theoretical Knowledge	40	66	21	34
Mathematical Skills	33	54	28	46
Communication Skills	39	64	22	36
Reading & Interpretive Skills	43	70	18	30
Clerical Skills	41	67	20	33
Personal Relations Skills	43	70	18	30
Supervisory Skills	45	74	16	26

26 employers (43%) indicated a perception of above average importance to the job. The mean score derived was 3.02. Communication Skills were ranked sixth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 39 employers (64%) indicated that they perceived a need for further training while 22 employers (36%) indicated that they did not perceive a need for further training.

In the area of Reading and Interpretive Skills eight employers (14%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by

28 employers (46%) and 25 employers (40%) indicated a perception of above average importance to the job. The mean score derived was 3.28. Reading and Interpretative Skills were ranked fifth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 43 employers (70%) indicated that they perceived a need for further training while 18 employers (30%) indicated that they did not perceive a need for further training.

In the area of Clerical Skills 16 employers (26%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 24 employers (39%) and 21 employers (35%) indicated a perception of above average importance to the jon. The mean score was 2.59. Clerical Skills were ranked eighth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 45 employers (74%) indicated that they perceived a need for further training while 16 employers (26%) indicated that they did not perceive a need for further training.

In the area of Personal Relations Skills six employers (10%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 16 employers (26%) and 39 employers (64%) indicated a perception of above average importance to the job. The mean score derived was 3.84. Personal Relations Skills were ranked third in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 43 employers (70%) indicated that they perceived a need for further training while 18 employers (30%) indicated that they did not perceive a need for further training.

In the area of Supervisory Skills 25 employers (41%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 16 employers (26%) and 20 employers (33%) indicated a perception of above average importance to the job. The mean score derived was 2.95. Supervisory Skills were ranked seventh in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 45 employers (74%) indicated that they perceived a need for further training while 16 employers (26%) indicated that they did not perceive a need for further training.

Responses Made by Employers of Graduates of Two-Year Programs. In the area of Manual Job Skills ten employers (27%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by ten employers (27%) and 19 employers (47%) indicated a perception of above average importance to the job. The mean score was 3.28. Manual Job Skills were ranked fourth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 18 employers (46%) indicated that they perceived a need for further training while 21 employers (54%) indicated that they did not perceive a need for further training.

In the area of Job Practical Knowledge no one indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 13 employers (34%) and 26 employers (66%) indicated a perception of above average importance to the job. The mean score derived was 3.90. Job Practical Knowledge ranked first in order of importance to the job. In regard to the

TABLE XII

DISTRIBUTION OF PERCEPTIONS BY EMPLOYERS OF GRADUATES OF TWO-YEAR PROGRAMS IN REGARD TO IMPORTANCE OF THE NINE SKILLS TO THE JOB

Skill Area	How Important Is This Skill To His Job?										Mean Score	Rank Order
	No Real Importance 1		Of Some Importance 2		Of Considerable Importance 3		Of Major Importance 4		Of Critical Importance 5			
	N	%	N	%	N	%	N	%	N	%		
Manual Job Skills	4	11	6	16	10	26	13	34	6	13	3.28	4
Job Practical Knowledge					13	34	17	44	9	22	3.90	1
Job Theoretical Knowledge					22	56	10	26	7	18	3.62	2
Mathematical Skills	5	13	14	36	10	26	7	18	3	7	2.72	8
Communication Skills	3	8	10	26	10	26	13	34	3	6	3.15	6
Reading & Interpretive Skills	2	6	3	8	18	46	15	38	1	2	3.26	5
Clerical Skills	4	11	16	41	8	20	10	26	1	2	2.70	9
Personal Relations Skills			6	16	15	38	12	31	6	15	3.46	3
Supervisory Skills	4	11	8	21	15	38	9	23	3	7	2.97	7

question, "Do you feel these graduates need further training in this skill?", 20 employers (51%) indicated that they perceived a need for further training while 19 employers (49%) indicated that they did not perceive a need for further training.

TABLE XIII

PERCEPTIONS OF EMPLOYERS OF GRADUATES OF TWO-YEAR PROGRAMS REGARDING THE NEED FOR FURTHER TRAINING

Skill Areas	Does He Need Further Training in This Skill?			
	Yes		No	
	N	%	N	%
Manual Job Skills	18	46	21	54
Job Practical Knowledge	20	51	19	49
Job Theoretical Knowledge	17	44	22	56
Mathematical Skills	17	44	22	56
Communication Skills	22	56	17	44
Reading & Interpretive Skills	20	51	19	49
Clerical Skills	20	51	19	49
Personal Relations Skills	21	54	18	46
Supervisory Skills	22	56	17	44

In the area of Job Theoretical Knowledge no one indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 22 employers (56%) and 17 employers (44%) indicated a perception of above average importance

to the job. The mean score derived was 3.62. Job Theoretical Knowledge ranked second in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 17 employers (44%) indicated that they did not perceive a need for further training.

In the area of Mathematical Skills 19 employers (48%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by ten employers (26%) and ten employers (26%) indicated a perception of above average importance to the job. The mean score derived was 2.72. Mathematical Skills ranked eighth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 17 employers (44%) indicated that they perceived a need for further training while 22 employers (56%) indicated that they did not perceive a need for further training.

In the area of Communication Skills 13 employers (34%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by ten employers (26%) and 16 employers (40%) indicated a perception of above average importance to the job. The mean score derived was 3.15. Communication Skills ranked sixth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 22 employers (56%) indicated that they perceived a need for further training while 17 employers (44%) indicated that they did not perceive a need for further training.

In the area of Reading and Interpretive Skills five employers (14%) indicated a perception of less than average importance to the

job. A perception of average importance to the job was indicated by 18 employers (46%) and 16 employers (40%) indicated a perception of above average importance to the job. The mean score derived was 3.26. Reading and Interpretive Skills ranked fifth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 20 employers (51%) indicated that they perceived a need for further training while 19 employers (49%) indicated that they did not perceive a need for further training.

In the area of Clerical Skills 20 employers (52%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by eight employers (20%) and 11 employers (28%) indicated a perception of above average importance to the job. The mean score derived was 2.70. Clerical Skills was ranked ninth in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 20 employers (51%) indicated that they perceived a need for further training while 19 employers (49%) indicated that they did not perceive a need for further training.

In the area of Personal Relations Skills six employers (16%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 15 employers (38%) and 18 employers (46%) indicated a perception of above average importance to the job. The mean score derived was 3.46. Personal Relations Skills ranked third in order of importance to the job. In regard to the question,"Do you feel these graduates need further training in this skill?", 21 employers (54%) indicated that they perceived a need for further training while 18 employers (46%) indicated

that they did not perceive a need for further training.

In the area of Supervisory Skills 12 employers (31%) indicated a perception of less than average importance to the job. A perception of average importance to the job was indicated by 15 employers (38%) and 12 employers (31%) indicated a perception of above average importance to the job. The mean score derived was 2.97. Supervisory Skills ranked seventh in order of importance to the job. In regard to the question, "Do you feel these graduates need further training in this skill?", 22 employers (56%) indicated that they perceived a need for further training while 17 employers (44%) indicated that they did not perceive a need for further training.

Research Question 3.

How do employer and employee perceptions of the importance of the skill to the job compare?

Two treatments were chosen to indicate the degree of agreement or disagreement in regard to employer and employee perception of the importance of the nine skill areas to the job. They were the Pearson Product Moment Correlation Coefficient and the Kendall's Coefficient of Concordance.

The Pearson Product Moment Correlation Coefficient was used to compare each of the skill areas separately. For graduates of one-year programs and their employers Table XIV shows the following information: Seven of the nine skill areas reached a value which it was ascertained was statistically significant at the .05 level. This does not imply causation. It simply indicates that graduates of one-year programs and their employers view the importance of the nine skill levels in essen-

TABLE XIV

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

Skill Areas	One-Year Programs		Two-Year Programs	
		Significant		Significant
Manual Job Skills	.85	Yes	.29	No
Job Practical Knowledge	.09	No	.25	No
Job Theoretical Knowledge	.60	Yes	.33	Yes
Mathematical Skills	.37	Yes	.31	No
Communication Skills	.29	Yes	-.01	No
Reading & Interpretive Skills	.29	Yes	.26	No
Clerical Skills	.32	Yes	.29	No
Personal Relations Skills	.29	Yes	.37	Yes
Supervisory Skills	.21	No	.47	Yes
.05 Value for One-Year Programs	.27			
.05 Value for Two-Year Programs	.32			

tially the same manner. The two areas which did not attain statistical significance at the .05 level were Job Practical Knowledge and Supervisory Skills. This does not necessarily indicate that the employer and his employee are in disagreement as to the importance of these skills. It does indicate that there is a possibility that the agreement or disagreement occurred by chance.

The Kendall's Coefficient of Concordance is used to show the degree of agreement of the independent rankings of two or more groups in regard to two or more items, or persons. Table XV shows the relative importance of the nine skill areas to the job as perceived by graduates of one-year programs and their employers. Means were computed and graphed in Table XV, in addition the arithmetic means were shown and the rank order developed and shown for each of the skill areas. The Kendall's Coefficient of Concordance, W, for one-year programs was .96, which indicates a very high level of agreement between graduates and their employers in regard to the relative importance of the nine skill areas to the job.

The significance of the statistic W was tested by computing a X^2. The null hypothesis, Ho, posited for the Kendall's chi-square test in that the K rankings are unrelated. Therefore, a significant chi-square value would indicate that the rankings are related in a statistically significant manner.

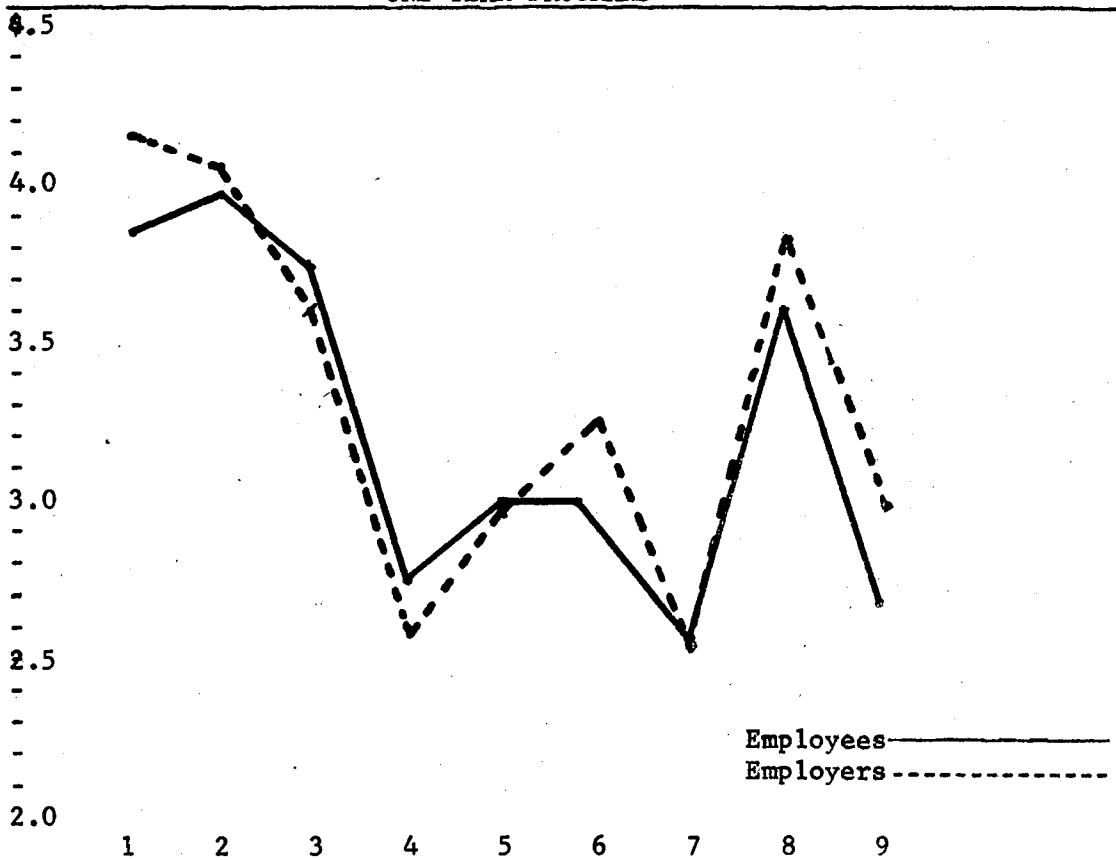
The W, calculated for one-year programs was significant at the .06 level indicating that this degree of agreement could have occurred by chance only six times out of 100.

The Pearson Product Moment Correlation Coefficient values calculated for graduates of two-year programs and their employers reached

TABLE XV

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

ONE YEAR PROGRAMS



Skill Areas	Employers		Employees	
	Mean	Rank	Mean	Rank
1. Manual Job Skills	4.15	1	3.85	2
2. Job Practical Knowledge	4.07	2	3.97	1
3. Job Theoretical Knowledge	3.60	4	3.76	3
4. Mathematical Skills	2.57	9	2.74	7
5. Communications Skills	3.02	6	3.08	5.5
6. Reading & Interpretive Skills	3.28	5	3.08	5.5
7. Clerical Skills	2.59	8	2.56	9
8. Personal Relations Skills	3.84	3	3.62	4
9. Supervisory Skills	2.95	7	2.67	8

Kendall's Coefficeint of Concordance

W= .96 χ^2 = 15.30 Significance reached at .06 level

the .05 level of significance in only three areas, Job Theoretical Knowledge, Personal Relations Skills, and Supervisory Skills. The other six skill areas do not reach the .05 level though several do reach significance between .05 and .10.

In this particular case the Pearson Product Moment Correlation Coefficient which deals with matched pairs of subjects presents the reader with a statistic which could easily be misconstrued as it shows rather low levels of agreement. The computed means on the other hand and the comparison of rank ordering of the nine skills by graduates and their employers shows a much higher level of agreement.

The Kendall's Coefficient of Concordance W, for two-year programs was 1.00. This indicates that graduates of two-year programs and their employers ranked the nine skills in exactly the same order in regard to relative importance of the skills to the job. The chi-square computed to test the significance of the statistic W, was 16.00 This value indicates that the Kendall's Coefficient of Concordance is significant at the .05 level. That is to say this degree of agreement could have occurred by chance only, five times out of 100.

Research Question 4.

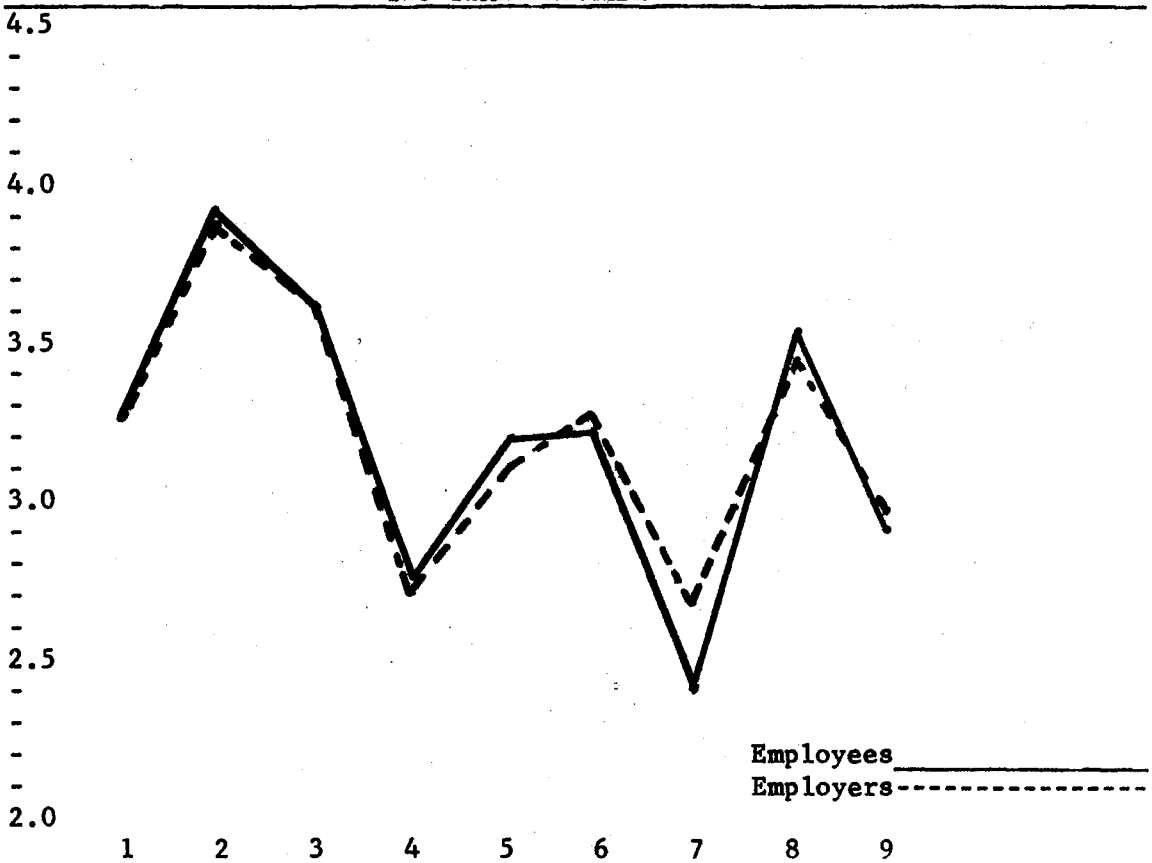
How do employer and employee perceptions on the need for further training compare?

The chi-square test was chosen to examine the responses of graduates and their employers. The null hypothesis set forth was that there was no difference in the perceptions of employees and their employers in regard to the need for further training. The .05 level of rejection was chosen which would mean that a significant value would emerge only

TABLE XVI

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

TWO YEAR PROGRAMS



Skill Areas	Employers		Employees	
	Mean	Rank	Mean	Rank
1. Manual Job Skills	3.28	4	3.28	4
2. Job Practical Knowledge	3.90	1	3.92	1
3. Job Theoretical Knowledge	3.62	2	3.62	2
4. Mathematical Skills	2.72	8	2.77	8
5. Communication Skills	3.15	6	3.20	6
6. Reading & Interpretive Skills	3.26	5	3.21	5
7. Clerical Skills	2.70	9	2.41	9
8. Personal Relations Skills	3.46	3	3.56	3
9. Supervisory Skills	2.97	7	2.90	7

Kendall's Coefficient of Concordance

W= 1.00 X^2= 16.00 Significance reached at .05 level

TABLE XVII

CHI-SQUARE VALUES DERIVED FROM COMPARISON OF EMPLOYER AND EMPLOYEE PERCEPTION OF NEED FOR ADDITIONAL TRAINING

Skill Areas	One-Year Programs	Two-Year Programs
Manual Job Skills	.007	.0689
Job Practical Knowledge	.4952	.7942
Job Theoretical Knowledge	.5324	.2549
Mathematical Skills	.9515	.9688
Communication Skills	.2615	.2583
Reading & Interpretive Skills	2.2054	1.3237
Clerical Skills	1.3093	3.6818
Personal Relations Skills	.1278	.5944
Supervisory Skills	0.0	.0271

.05 Value for Both Programs 3.84

No Chi-square computed for this Table reached the point .05 level of significance.

five times in 100 by chance. The null hypothesis failed to be rejected in all instances.

This indicates that graduates of The Texas State Technical Institute and their employers view the need for additional training in the nine skill areas in essentially the same way.

Summary

In summary the data presented in this chapter indicates that graduates of The Texas State Technical Institute and their employers perceive the importance of the various skills to the job and the need for further training in much the same way. A comparison of the relative importance assigned to each of the skill areas by graduates and their employers resulted in high values for the Kendall's Coefficient of Correlation. The chi-square computed to ascertain the degree of agreement or disagreement between the two groups in regard to the need for further training all failed to reject the null hypothesis at the .05 level, thus indicating that amount of agreement between the two groups could have occurred by chance only five times in 100. Selected statements by employers, included in Appendix D, and by employees, included in Appendix C, indicated that for the most part both groups are well pleased with the training received. Several suggestions, however, were made that it was felt would improve training opportunities for future students.

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The problem for this study was the lack of data pertaining to the preparation of Vocational-Technical students at The Texas State Technical Technical Institute. The specific objectives involved were to ascertain employer and employee perception as to the importance of the nine skill areas to the job, the perception of need for additional training, and how those perceptions compared. Data was to be analyzed for possible use as a curriculum change device.

Data were collected by means of two questionnaires. The first was mailed to each of the 1970-71 graduates of the James Connally Campus of The Texas State Technical Institute. The second was mailed to their employers. The nine skill area items and questions as to the importance of the skill to job and need for additional training are common to both questionnaires. By the closing date of the study, January 13, 1972, 251 graduate returns and 102 employer returns had been received. The return percentages were 62% for graduates and 63% for employers.

Findings

Examination of the returns revealed the following:

Of the one-year graduates, 63% were employed, 24% were continuing their education, 9% were in the military services, and 4% were un-

employed. Graduates of two-year programs were distributed as follows: 70% were employed, 21% continued their education, 7% were in the military services, with only 2% unemployed. Of the four-year graduates responding 77% were employed and 23% were in the military.

Examination of the data in Chapter IV indicates that graduates and their employers perceive the importance of the nine skill areas in much the same way. In a rank ordering of the nine skill areas by graduates of one-year programs and their employers the following rankings were assigned:

	Rank Order	
	Employers	Employees
Manual Job Skills	1	2
Job Practical Knowledge	2	1
Job Theoretical Knowledge	4	3
Mathematical Skills	9	7
Communication Skills	6	5.5
Reading & Interpretive Skills	5	5.5
Clerical Skills	8	9
Personal Relations Skills	3	4
Supervisory Skills	7	8

Kendall's Coefficient of Concordance calculated on the mean score of the nine skill areas revealed a W of .96 which reached a statistically significant level at .06.

An examination of responses by graduates of two-year programs and their employers indicated almost complete agreement as to the importance of the nine skills to the job. In a rank ordering of the nine skill areas by graduates of two-year programs and their employers the following rankings were assigned:

	Rank Order	
	Employers	Employees
Manual Job Skills	4	4
Job Practical Knowledge	1	1
Job Theoretical Knowledge	2	2
Mathematical Skills	8	8
Communication Skills	6	6
Reading & Interpretive Skills	5	5
Clerical Skills	9	9
Personal Relations Skills	3	3
Supervisory Skills	7	7

A Kendall's Coefficient of Correlation calculated for graduates of two-year programs and their employers revealed a W, of 1.00 which reached a level of statistical significance at the .05 level.

In regard to the question of need for further training one-year graduates of programs indicated that they perceived a need for further training in all areas except Mathematical Skills. Their employers indicated that they perceived a need for additional training in all skill areas. For graduates of two-year programs and their employers a check of responses revealed that graduates perceived a need for further training in all areas except Job Theoretical Knowledge, Mathematical Skills, and Clerical Skills. Employers of graduates of two-year programs indicated a need for further training in all areas except Manual Job Skills, Job Theoretical Knowledge, and Mathematical Skills.

Graduates of four-year programs indicated a perception of average or above average importance of skill to the job for all nine of the skill areas. They ranked Personal Relations Skills as the most important and Mathematical Skills as the least important. In regard to

the need for further training they indicated a perception of need for additional training in all areas except Manual Job Skills and Clerical Skills. Due to the small number of responses by employers of graduates of four-year programs no statistical treatments were calculated for them.

Student responses on the open-end items were generally very favorable. The generalizeability of the information provided by student comments in this case, is limited due to the small number of responses. However, since several students made the same general comments and these comments deal with general type improvements it was felt that they should be included and that they provided data that should be given consideration. Four comments in particular were made by more than one student and are summarized here.

1. A need for additional training in welding skills.
2. A need for more hands-on-time in the curriculum.
3. A need for better facilities and equipment.
4. A need for a better job placement process.

Employers were also given a chance to voice their opinions in regard to needed improvements. Once again the number of employer comments was small, thereby limiting the ability of the information provided to the generalized to a larger population. For the most part employers were well pleased with the graduates that they had employed. They did, however, make the following observations.

1. A need for a better orientation as to what to expect in the way of earnings and job activities upon graduation.
2. A need for more hands-on-time in the curriculum.

Conclusions

The generalizability of this study is affected by three major limitations. First, the fact that 38 per cent of the graduates and 37 per cent of the employers did not return the questionnaire. Second, due to the short time frame, 1 October 1971 to 31 January 1972, available for this study and the large geographical area to be covered it was not possible to conduct a follow-up of non-respondents. Third, this study was conducted during the period immediately following graduation when most of the graduates had been on the job for less than six months. This short time on the job would affect the viewpoint of both the graduates and their employers toward the importance of certain activities and the need for additional training. While this does not destroy the value of the data gathered it does limit its generalizability to other populations. This condition could possibly be improved upon in the future by the development and implementation of a complete continuing follow-up system.

Based on the data presented in Chapter IV, statements of graduates, and statements by their employers the following conclusions were reached:

1. Graduates and their employers view the importance of the nine skill areas to the job in essentially the same manner.

2. Graduates and their employers view the need for additional training in essentially the same manner.

3. At the present time there is a need for additional hands-on-time in the curriculum for one and two-year programs.

4. For the entry type job normally gained by new graduates the four most important skill areas to the job were: Job Practical Knowledge, Job Theoretical Knowledge, Manual Job Skills, and Personal Relations Skills. There exists a perceived need for additional training in each of the four areas.

5. For the entry type job normally gained by new graduates the four least important skills were: Mathematical Skills, Clerical Skills, Communication Skills, and Supervisory Skills. There is a perceived need for additional training in all areas except mathematical skills. While these skills are rated of less than average importance to the job currently held by the graduate additional training may contribute to the ability of the graduate to be promoted in the future.

6. Inasmuch as the perceived importance of Personal Relations Skills increased at each level of increased preparation additional emphasis should be placed in this area for advanced students.

7. At the present time there appears to be a sufficient amount of mathematics in the curriculum.

8. There is a need for additional emphasis in the area of Job Theoretical Knowledge for one-year programs.

Recommendations

Based on the data obtained during this study, comments by graduates and their employers, and the conclusions drawn from analysis of that data the following recommendations are made.

1. The Texas State Technical Institute should take steps to insure the establishment of an effective continuing follow-up system.

2. Consideration should be given to the inclusion of more hands-

on-time in one and two-year programs.

3. Consideration should be given to placing additional emphasis in the areas of Job Practical Knowledge and Manual Job Skills for one and two-year programs.

4. Consideration should be given to developing orientation materials to acquaint the students with the importance of developing Personal Relations Skills, Supervisory Skills, and Communications Skills for their utility in providing the skills necessary for advancement on the job.

Recommendations for Further Study

A second follow-up of this same group should be undertaken in three years to ascertain their employemnt status and perception of training. This could result in the development of longitudinal information in regard to persistence in a particular job cluster and the transferability of training received. Effective development of the educational process will require both short and long range studies of this type in the future.

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APPENDIX A

LETTERS OF TRANSMITTAL AND INSTRUCTION

James Connally campus
TEXAS STATE TECHNICAL INSTITUTE
WACO, TEXAS 76705

OFFICE OF THE VICE PRESIDENT

October 25, 1971

Dear Graduate:

Texas State Technical Institute needs your help. At Texas State Technical Institute we are interested in providing the most effective up-to-date training possible. In order to provide this type of training it is necessary to constantly change and improve our course offerings. As a ~~recent~~ graduate ~~and new employee~~ your opinion as to the adequacy of the training received at the Texas State Technical Institute would be of great value to the institution and future students who will attend the Texas State Technical Institute.

We would appreciate it very much if you would complete the enclosed questionaire and return it in the self-addressed prestamped envelope provided. This information will be kept strictly confidential and used for educational improvement purposes only. By completing and returning this questionaire you will have been of great service to the Texas State Technical Institute and its future students.

We are proud of each of you who has graduated from TSTI and are our representatives to the world of industry. Your taking time to complete and return this questionaire is deeply appreciated.

Sincerely yours,

J. E. Tompkins

Jack E. Tompkins
Vice President

James Connally campus
TEXAS STATE TECHNICAL INSTITUTE
WACO, TEXAS 76705

OFFICE OF THE VICE PRESIDENT

December 6, 1971

Dear Graduate:

Texas State Technical Institute needs your help. At Texas State Technical Institute we are interested in providing the most effective up-to-date training possible. In order to provide this type of training it is necessary to constantly change and improve our course offerings. As a recent graduate and new employee your opinion as to the adequacy of the training received at the Texas State Technical Institute would be of great value to the institution and future students who will attend the Texas State Technical Institute.

We would appreciate it very much if you would complete the enclosed questionaire and return it in the self-addressed prestamped envelope provided. This information will be kept strictly confidential and used for educational improvement purposes only. By completing and returning this questionaire you will have been of great service to the Texas State Technical Institute and its future students.

We are proud of each of you who has graduated from TSTI and are our representatives to the world of industry. Your taking time to complete and return this questionaire is deeply appreciated.

Sincerely yours,

J. E. Tompkins

Jack E. Tompkins
Vice President

James Connally campus
TEXAS STATE TECHNICAL INSTITUTE
WACO, TEXAS 76705

OFFICE OF THE VICE PRESIDENT

October 25 1971

Dear Employer:

Texas State Technical Institute needs your help. ~~At Texas State Technical Institute~~ we are interested in providing the most effective up-to-date training possible. In order to provide this type of training it is necessary to constantly change and improve our course offerings. As an employer of our graduates your opinion as to the adequacy of the training received, by your employee, at Texas State Technical Institute would be of great value to the institution and future students ~~who will attend the Texas State Technical Institute~~.

We would appreciate it very much if you would complete the enclosed questionaire and return it in the self-addressed prestamped envelope provided. This information will be kept strictly confidential and used for educational improvement purposes only. By completing and returning this questionaire you will have been of great service to the Texas State Technical Institute and its future students.

We are proud of our graduates and are gratified that you have chosen to employ them ~~in your firm~~. Your taking time to complete and return this questionaire is deeply appreciated.

Sincerely yours,

J. E. Tompkins

Jack E. Tompkins
Vice President

APPENDIX B

DATA COLLECTION INSTRUMENTS

PREFACE TO DATA COLLECTION INSTRUMENTS

At the time the questionnaire was being developed it was originally intended to use only the two questions regarding the importance of the nine skill areas to the job and the need for additional training.

The researcher retained the additional items on the two questionnaires for the use of TSTI and their findings will not be treated in this study. It should be noted that only the originally intended questions are common to both questionnaires.

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

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

Indicate your answers by marking appropriate boxes.

	How important is this skill for your present job?					How much of this skill was learned at TSTI?					Where did you learn most about this skill?					Do you feel a need for more instruction or training in this area? Mark either.	
	1 Of No Real Importance	2 Of Some Importance	3 Of Considerable Importance	4 Of Major Importance	5 Of Critical Importance	1 Almost Nothing	2 Some But Not Much	3 About 50%	4 Large Amount	5 Almost All	1 High School	2 TSTI	3 Apprentice Program	4 On Regular Job	5 Elsewhere	YES	NO
MANUAL JOB SKILLS. Refers to skill at using or operating tools, equipment, materials, machines, etc. in your work																	
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.																	
MATHEMATICAL SKILLS. Refers to ability to use arithmetic or higher mathematics to solve work problems.																	
COMMUNICATION SKILLS. Refers to skill at speaking, writing, drafting, sketching, etc., to communicate ideas.																	
READING AND INTERPRETIVE SKILLS. Refers to skill in reading printed matter, blueprints, tables, diagrams, etc.																	
CLERICAL SKILLS. Refers to skill at keeping records, making out reports, and other types of routine paper work.																	
PERSONAL RELATIONS SKILLS. Refers to skill at dealing with people, such as customers, co-workers, other trades, etc.																	
SUPERVISORY SKILLS. Refers to skill at supervising others, e.g., instructing, directing, evaluating, planning, organizing, 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 TSTI.

	Poor	Fair	Satisfactory	Excellent	Outstanding
1. Quality of instruction from shop instructors.					
2. Quality of instruction from academic teachers.					
3. Condition of shop facilities and equipment.					
4. General physical condition of school					
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 the school in community.					
10. Strictness of school in maintaining discipline.					

Please make any comments you wish on the reverse side of this questionaire concerning changes or improvements you would like to see made.

ALL INFORMATION ON THIS QUESTIONAIRE 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 _____

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 appropriate boxes.

	How important is this skill to his present job?					How would you evaluate him on his skill?					How does he compare with other entry workers who have had other training?					Do you feel a need for more instruction or training in this area? Mark either.	
	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 lowest 5%	2. Falls in lower 20%	3. Falls in middle 50%	4. Falls in upper 20%	5. Falls in upper 5%	YES	NO
MANUAL JOB SKILLS. Refers to skill at using or operating tools, equipment, materials, machines, etc. in your work																	
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.																	
MATHEMATICAL SKILLS. Refers to ability to use arithmetic or higher mathematics to solve work problems.																	
COMMUNICATION SKILLS. Refers to skill at speaking, writing, drafting, sketching, etc., to communicate ideas.																	
READING AND INTERPRETIVE SKILLS. Refers to skill in reading printed matter, blueprints, tables, diagrams, etc.																	
CLERICAL SKILLS. Refers to skill at keeping records, making out reports, and other types of routine paper work.																	
PERSONAL RELATIONS SKILLS. Refers to skill at dealing with people, such as customers, co-workers, other trades, etc.																	
SUPERVISORY SKILLS. Refers to skill at supervising others, e.g., instructing, directing, evaluating, planning, organizing, etc.																	
ATTITUDE TOWARD WORK. Refers to such behavior as absenteeism, rule violation, concern for quality work, cooperation, etc.																	

Please make any comments you wish on the reverse side of this questionaire concerning changes or improvements.

APPENDIX C

SELECTED STUDENT COMMENTS

In my opinion in my particular technology, DLT, there are too many instructors with military background, sometimes using this in teaching. In fact, in DLT, military background would almost seem to be a pre-requisite for the job. Less of the above would be better. Thank you very much for allowing me to express myself.

It seems to me that too many of the military pepple are still here. By that I mean that they were here when the base closed and they are trying to operate TSTI the same way the military operated.

My biggest gripe is the student center which costs the student $21 per year regardless if he or she cares to go there. I much prefer to eat at the malt bar. Two ping-pong tables and one TV shouldn't cost $21 times the number of students per year. You pay when served for everything else at the student center.

I believe that discipline needs to be improved at TSTI. Students are allowed too many absences (unexcused) and tardies. If a person is not interested in his education drop him and make room for someone that is. I found many of the instructors too lenient in their grading. If a diploma or certificate is to be of value it must be earned.

As far as lab or shop classes are concerned TSTI has a good program but the lectures my instructors gave were not very good; they were good mechanics, but not very good as teachers.

Need better facilities in LRD. Need facilities for livestock on campus. Need better Rodeo Club facilities which will interest students more. Need better dorm facilities. Overall, very good campus.

In the type of work I do, I don't feel I learned enough about it.

I work on heavy earth moving equipment such as scrapers, dozers, blades, tail dumps and bellie dumps. I didn't get enough training or practice in this type of work and there is a lot of this to do on any construction job.

I work in the field on a truck. I don't have the convenience of many tools. About all I have is a hand cutting torch and a welding machine. When they want a machine fixed, they want the least down time as possible because time is money, especially on a road job.

I think I could have been better prepared for this work. A lot more time should be spent on layout for one thing. I don't think this type of work was ever talked about the whole time I was there.

One improvement that should be made is more interviews with company owners before you get too close to graduation. More equipment to work with in lab work. A more overall study of the whole A/C and Heating business and not so much just on service. More study should be made on sizing equipment, duct, and how to install it. More study on the service and installation of central heat and commercial equipment.

I would just like to add that I enjoyed going to TSTI. I learned a great skill which I enjoy doing very much. I met my husband there and a lot of other great people. My instructors were good teachers and were always there when you needed them. Anytime someone asks me about a school I tell them about TSTI. It is a new school and needs a lot of things changed but I enjoyed going there.

I was a student in the Combination Welding Program. The instruction ability of the instructors was fair, but some of them were sort of self-centered. The equipment we worked with was of very high quality and in good working condition.

One of my main problems now in my field of work is that I was not trained to any extent in the field of metal-inert gas and Tungsten inert gas welding. I have been turned down on a job with very good beneficial and salary standards because of my inability to operate this machinery properly and in a professional method.

If more time were spent on the final trimester of school in lab rather than in a course such as Human Relations, I feel a student would benefit to a great extent.

Without the help of TSTI, I would never have the job that I now have. It is an outstanding school for anyone that wants to learn a trade. It would take two years in the field to learn what I picked up in school. Now I do know what is the right way to do my job.

Changes and improvements needed: better living conditions for students in dormitories and improved conditions in cafeteria. TSTI is an excellent school for job learning skills and knowledge in the interest of the student. I would recommend it to anyone interested in the areas provided by TSTI.

I think the instructors should have a better knowledge of the methods used in industry today. Most of their ideas went out with the horse and wagon, or steam locomotive.

More welding taught at the institution to students taking C.E.M. More time devoted to students in the hydraulic line of work. The ability to get along with others, etc.

Though I took Refrigeration Mechanics at TSTI and am now an apprentice electrician, I feel my training at TSTI helped me considerably to get my job. Also my experiences at TSTI in the job routines practiced by contractors on a business basis helped to make me feel at ease on my first job. I hope my comments help you, and I thank you for the opportunity to have been a part of the student body at TSTI.

I had a few useless courses such as drafting, mathematics, technical writing, a course in Industrial Safety taught by an academic teacher.

A student in Auto Mechanics should be taught by successful professional men in the automotive fields. An instructor with only an academic degree is useless in technical skills instruction.

I am working beside a graduate of my class who cannot make it as a mechanic because of his lack of experience and professional training. I don't think he will be working here very long.

Just keep up with the new methods of welding and teach it to the students. Also teach them that they wont have but one chance to do the job correctly, and teach them to work with speed and quality. TSTI is one of the best schools that I could have ever gone to. I am really proud of myself and TSTI and all the instructors.

Keep the good work up at TSTI.

Neither the time or the space permit me to expand on this subject as I would like to at this time. But for what it is worth there are so many small things that may get your attention.

I received your first form and immediately threw it in the waste basket, as I felt sure it would be a waste of my time. I still think my effort alone will not make one difference in the program. But upon talking with others I decided to see just how much I would be listened to if I did respond.

In the dental assisting program there is a definite need for another instructor, preferably another certified assistant to give aid to the instructor already there. She should be fully qualified in this field and be a full time instructor. One of the instructors is CHARM herself, and has been very instructive in my training. On the other hand, one of the other instructors is a very likeable individual whom I enjoyed being around very much but his inability to articulate clearly has been a certain drawback to my ability to learn under him. His instructions in the lab were completely worthless although he tried very hard. I think he should be replaced with a more up-to-date doctor. His ideas on some phases of dentistry are very outdated. He would make a fine advisor but he does not fulfill the needs for teaching.

The dentist I work for has donated some of his time off to teaching on a voluntary basis. He felt the need to bring the assistants more current with the dental offices of today. I wish it were possible to hire different dentists in the area to come and teach a certain number of hours on various subjects to the students. If it were presented to the Waco dentists (who are very good at complaining about the quality of the graduates sometimes) in the right light I feel they would take

some action to help solve this problem. At times one would come and speak for an hour or two on a subject but not thoroughly enough to stimulate motivation in the class. I think a subject should be covered thoroughly by each speaker. I know the funds are limited but surely the dentists of Waco would be more proud of our assistants if they had a bigger part in their training. While I am on the subject of the Waco dentists, I think they would teach a student more if they had to spend a little money to have them in the office; the students need the money for transportation and it makes them aware of the office. Everybody agrees that people appreciate more what they pay for than what is given to them. Our students could be appreciated more in some of the offices. This was not my case, but I know that it was for some. It makes one have a low esteem to learn where they are not appreciated. The fee should be exactly the same for all students on an hourly basis.

Before my space runs out, may I take a few minutes and say that I love people, education and life. My experience at TSTI was one I will ever treasure but if I ever had an opportunity to do a good house cleaning at TSTI there are some persons whom I feel would have to go. One of the instructors is a very dedicated man but he needs to be placed in some position other than teaching the students. I am not a young carefree person, as you can tell by my records. I have lived all over the world and meet all kinds of people. I am a very good judge of people usually. Please excuse my typing - not one of my better feats.

Better laboratory facilities. Improvement of vocational counseling given to students. More aid in finding jobs for students.

In Dental Laboratory Program at TSTI it was basically very good. The students should be taught to do more waxing, pouring dies, everything and more larger cases. I am just now beginning to get on my feet as to what this program is about. I was taught well but I did not do enough work. When you get out into this field it is hard. You have got to work at it to get anywhere. I would advise the students who are in this program now to listen to the teachers when they say it isn't going to be easy when you get out. They had better study and learn all they can. I wouldn't advise anyone to open a lab as soon as they get out because it is hard enough working for someone else.

You have a fine school and all techniques are up to standard, but my son went to school under the assumption that he would be skilled enough when he passed the course at your school to be able to step into any welding job. (I think if students cannot pass your course it is understandable, but your tests should be as rigid as any company would give, so that when they leave your school with diploma in hand, it means they are qualified to pass the most rigorous test put to them by companies). I have several boys, plus my own, that went from place to place, and these companies had "help wanted" signs out, had them put on the welding gear and barely begin and told them to shuck it, they wouldn't do. This was disheartening to them. I also found out that the diploma didn't mean a thing, it was experience but through connections my son worked a very short time for Brown and Root and then was told to re-apply later as an apprentice. After much heartbreak and interviews, he got a job at a General Welding Shop in Houston. They had a fit over his work and he could have worked his way

into a fairly decent position in time, but in the meantime, the one and only welding shop in our town closed (owner retired) and my son bought it and now is the owner of his own welding service in our town.

He is also a volunteer fireman and a member of the Lions Club at twenty years of age.

In the air-conditioning department the theory is excellent. The department is very deficient in equipment and practical experience.

I have taken a job with a major air conditioning company and have experienced the shock that in commercial air conditioning there are many centrifugal compressors in use. Also there are many large absorption machines used. These two particular items, TSTI does not have and therefore the students are at a disadvantage.

I think more career people should be teaching Dental Lab. Tech. Not retired men from service. Men who have worked under the everyday pressures from doctors (who are interested in making money) would better qualify for instructors. These men could better explain techniques in speed and quality.

I believe I have received very valuable training at your school and in the near future I plan to use my dental tech training. I worked for a dental laboratory for about six months. I changed jobs because of low salary, in accordance with the high cost of living and my many obligations. I will probably go into military service soon and use my knowledge of dental tech there - hopefully.

I graduated from the RTU section August 5, 1971.

Here is my one very important comment. The instruction I received was very good, but I think the third trimester which covered Color TV should be increased to twenty-five or thirty weeks instead of the present fifteen weeks.

P.S. The reason for the above view: too much to learn and too little time allotted to it.

The aviation maintenance department could be greatly improved if there was some way to dispose of the junk material stored in Building 4-14 (?) and the proceeds used to buy suitable training materials in sufficient quantity to accomodate the students as they advance through this course of study.

On the whole, TSTI is a fine school, although there is plenty of room for improvements, especially in the shops and their facilities. When I finish my education I know the training received will be used.

Heavy Truck Mechanics needs to be a two-year course. It needs newer equipment and more diesel training. It needs practical experience in using a chassis dynomometer.

More on the job training. Too much lecture.

APPENDIX D

SELECTED EMPLOYER COMMENTS

These two employees are making real good carpenters, but most of their knowledge has come from on-the-job training. One of the employees worked part-time for me while attending classes at TSTI. I believe a lot more could be either added to, or put into, the program you have for this type of work.

Our employee is outstanding. His work is almost as good as good older men. I can't say enough good things about him. He will earn $10,000 this year.

As an employer of a graduate of Texas State Technical Institute, I would like to see more training by doing it, breaking down primal cuts, use of saw to trim bones for custom processing meats, practice meat cutting, using what we call the "regular cut" which is easy to change to satisfy any employer in the meat industry. We all have a special trick of the trade, which is no more than an item that represents the plant and our processing. Ours is Rolled Rump Roast. Our employee, in our opinion, is far more than your average graduate, for in less than sixty days under our training, he has assumed full responsibility for his jobs which are slaughter man and meatcutter.

We are very pleased with our graduate of your institution. He is responsible for our Media Center and photographic darkrooms, which serves not only our department, but the four other academic departments (graduate and undergraduate)* which comprise the College of Architecture and Environmental Design. He is doing an outstandingly good job.

*A total of some 850 students and 50 faculty members.

The dental lab technician should be taught more of the physiology or why an appliance is built the way it is. Example: how the wrong shape of a pontic in a bridge can cause tissue damage, or how balancing interferences can cause tooth loss, or why a rough area in a denture causes soreness.

Written communications appears to be a weak area in the graduate of your institution whom we employed. Technically he can express himself adequately but his weakness shows in sales presentation. We are well pleased with his overall ability and conscientious endeavor.

We are well pleased with our employee. He is quite mature for his age, and very dependable. Of course he has a lot to learn about the job, but he is willing and able to learn. If his spelling and handwriting were better it would be an asset to him. Our answers to the question regarding the need for further training in given areas reflect our thinking about this employee, and probably would not apply to another person with different aptitudes.

I regret that we are unable to identify your students once they are hired by this installation without a serarch of over 4,000 files.

Due to the fact that some have been hired with a training background from your school, proves that your training is worthwhile, else they would have been unable to meet the high experience and training requirements set by the Civil Service Commission for federal service positions. It is hoped that the above information will be of some value in evaluating your program.

In reply to your questionnaire concerning the subject graduate, please be advised that I did not get to keep him long enough to find out much. However, what I did learn about him, I liked. He started to work for me in August, and the Army took him in September. That is probably the shortest run in your history of any graduate.

I did not feel that I could do much with the questionnaire. I do, however, wish to state that he seemed to know what it was all about, and I do believe that when he gets back, he will turn out to be really first class help.

Sorry I could not be of more help. I remain,

About the only criticism I have (maybe I should say suggestion) is that these young men have been led to believe that they are better than they really are. The theory and attitude is good but they are not finished technicians when they graduate from TSTI. They have been told how much money they are going to make and when you put them at 50-50 they almost starve. Our experience has been that our employees have gotten better every week. We are very happy with our young men and hope to employ more in the future.

When I began teaching I made $3200 a year. Twelve years later I made $11,500. Experience does pay and to be good you have got to have it.

The graduate of your school that we hired is presently employed as a party chief for a boundary survey crew. He has excellent capabilities and instructional background for vertical control; however, his abilities with horizontal control are not nearly so good. We do think his back-

ground in schooling is excellent and probably adequate because schooling mostly opens the door to further learning. We think he has most all the qualities we seek in our employees. As said before, we think his educational background is entirely adequate, he is most ambitious, honest, neat in appearance, excellent manners, and absolutely no bad habits. As of this moment, we expect great things of him.

My short study of your school curriculum in Civil Engineering Technology leads me to think it is good and entirely adequate. No student can graduate from any school and be an expert on all phases of Engineering. A general, all encompassing course is all that can be given with the thought that the student will concentrate on the electives that best suit his career desires.

Thanks for this opportunity of reporting on the activities of one of your school graduates and you may rest assured that you will hear from us again as our employee progresses.

APPENDIX E

VOCATIONAL-TECHNICAL PROGRAMS - THE JAMES CONNALLY CAMPUS OF THE TEXAS STATE TECHNICAL INSTITUTE

The following programs were offered by the James Connally Campus of the Texas State Technical Institute which had graduates for the 1970-1971 academic year:

Air Conditioning and Refrigeration Mechanics

Air Conditioning and Refrigeration Technology

Aircraft Powerplant Mechanics

Airframe Mechanics

Aircraft Pilot Technology

Automatic Merchandise Service Specialist

Auto Body Repair

Automotive Mechanics

Automotive Technology

Building Construction Craftsman

Building Construction Technology

Combination Welding

Chemical Technology

Civil Engineering Technology

Construction Equipment Mechanics

Commercial Art and Advertising

Computer Science Technology

Dental Assistant

Dental Laboratory Technology

Electrical Power Distribution Technology

Electronics Technology

Farm Equipment Mechanics

Floriculture and Ornamental Horticulture

Graphics and Design Technology

Heavy Truck Mechanics

Instrumentation Technology

Livestock and Ranch Operations

Laser-Optical Technology

Machine Shop Operations

Meat Processing and Marketing

Medical Electronics Technology

Print Shop Operations

Radio and Television Repair

Seed Quality and Seed Processing Technology

Structural Steel Drafting

Technical Communications

Water and Waste Water Technology

Water Utilities Operator

Welding Technology

Programs offered by the James Connally Campus of The Texas State Technical Institute which had graduates for the 1970-71 academic year included in the respondent group:

Air Conditioning and Refrigeration Mechanics

Air Conditioning and Refrigeration Technology

Aircraft Powerplant Mechanics

Airframe Mechanics

Aircraft Pilot Technology

Automatic Merchandise Service Specialist

Auto Body Repair

Automotive Mechanics

Automotive Technology

Building Construction Craftsman

Building Construction Technology

Combination Welding

Chemical Technology

Civil Engineering Technology

Construction Equipment Mechanics

Commercial Art and Advertising

Computer Science Technology

Dental Assistant

Dental Laboratory Technology

Electrical Power Distribution Technology

Electronic Technology

Farm Equipment Mechanics

Floriculture and Ornamental Horticulture

Graphics and Design Technology

Heavy Truck Mechanics

Instrumentation Technology

Livestock and Ranch Operations

Machine Shop Operations

Meat Processing and Marketing

Medical Electronic Technology

Print Shop Operations

Radio and Television Repair

Seed Quality and Seed Processing Technology

Water and Waste Water Technology

Water Utilities Operator

Welding Technolgoy

VITA

Joseph Allen Vicars

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF EMPLOYER AND EMPLOYEE OPINION REGARDING THE ADEQUACY OF TRAINING OF VOCATIONAL-TECHNICAL STUDENTS AT THE TEXAS STATE TECHNICAL INSTITUTE

Major Field: Vocational-Technical and Career Education

Biographical:

Personal Data: Born in Richmond, Virginia, November 12, 1934, the son of Mr. and Mrs. A. J. Vicars.

Education: Graduated from Pleasant Grove High School, Dallas, Texas, in June, 1952; received Bachelor of Science degree in Secondary Education with a major in Social Studies from McMurry College in 1965; received Master of Education in Secondary School Administration from Abilene Christian College in 1970; graduate work in Vocational Industrial Education taken at Texas Agricultural and Mechanical University, 1967-68; enrolled in doctoral program at Oklahoma State University 1970-72; completed requirements for Doctor of Education degree at Oklahoma State University in May, 1972.

Professional Experience: Commissioned Officer, United States Army, 1956-1963; Tool and Die Maker, Dry Manufacturing Co., 1963-65; History teacher, Abilene ISD, 1965-67; Industrial Cooperative Training Coordinator, Sweetwater ISD, 1967-68; Industrial Cooperative Training Coordinator, Ysleta ISD, 1969-1970.