DEVELOPMENT AND EVALUATION OF A MODEL FOR CONDUCTING A FOLLOW-UP STUDY OF TECHNICIAN PROGRAM GRADUATES

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CHAPTER I

INTRODUCTION

The purpose of technician education is to prepare individuals for mid-level employment in any one of several fields. Graduates of technician programs in the United States generally work in industry. In Thailand, technician graduates work not only in industry, but also as instructors in technical institutes. The graduates of technician programs may work in manufacturing, conduct experiments or test, calibrate, and operate instruments. They may also assist scientists or engineers in developing experimental equipment and models. Further, they may frequently assume responsibility for certain aspects of design as they contribute to an engineering team effort.

The quality and effectiveness of any technician program often depends upon several factors. Some of these factors include 1) the number and study potential of students enrolled, 2) the nature and extent of the curriculum, 3) the completeness and quality of the facilities and equipment, and 4) the stability of the institution. The responsibility of technician educators does not end when students graduate. It is important that the educators follow-up on their graduates. The importance of occupational follow-up was succinctly expressed in a quotation from the report of the Advisory Council on Vocational Education (1968).

Little (1970) stated that:

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

Statement of the Problem

There has been a considerable amount of research conducted through follow-up studies of technical programs and their graduates related to salaries, career information, geographic data, and educational patterns of the graduates. Unfortunately, however, no follow-up study has attempted to develop and evaluate a model for conducting a follow-up study of technician program graduates as a means for improving the effectiveness of programs.

The Purpose of the Study

The purpose of this study was to develop and evaluate a model for conducting a follow-up study of technician program graduates. Concommitant objectives of the study included the following:

1. To determine to what extent the graduates are employed in the fields in which they received an Associate degree or the equivalent;

2. To determine the salary levels of graduates from automotive and electronics technology programs;

3. To determine the frequency of change from entry level to the present job within or outside the major fields of study;

4. To determine the graduates' need for additional formal education as perceived by the graduates, and

5. To state where the curriculum could be improved as perceived by the graduates.

Scope of the Study

This study involved graduates who earned an Associate degree or the equivalent in automotive technology and electronics technology at the Oklahoma State University School of Technical Training (OST) at Okmulgee, Texas State Technical Institute (TSTI) at Waco, and four Institute of Technology and Vocational Education (ITVE) campuses in Thailand whose names and locations are:

1. Bangkok Technical Institute (Bangkok),
2. Northern Technical Institute (Chiang Mai),
3. Northeastern Technical Institute (Nakhorn Rajsima),
4. Southern Technical Institute (Songkla).

Definition of Terms

The following terms are defined as used in the study:

Technician Education: A planned sequence of classroom and laboratory experiences at the post-secondary school level, but below the baccalaureate level which is designed to prepare a person for a cluster of job opportunities in a specialized field (Roberts, 1976).

Graduate: A person who majored in automotive or electronics technology at the post-secondary school level, and who has received an Associate degree or the equivalent.

Technical Institute: A post-secondary school which offers specialized educational programs to produce technicians. These programs are generally designed to develop broadly based competencies in specific fields of applied science, of sufficient depth that the graduate may be employed in one of the cluster of jobs. The Associate degree is generally awarded upon completion of the program (Roney, 1960).

Institute of Technology and Vocational Education (ITVE): An educational institution system in Thailand which offers several technician education programs at twenty-eight post-secondary schools administered through the Ministry of Education.

Related Field: An area of work that involves technical information that is usually presented in technical courses other than in the specialty area. An example of a related field to automotive would be welding. An example of a related field to electronics would be air-conditioning.

Assumptions

In analyzing the data associated with this study, the following assumptions were made:

1. The graduates provided true factual personal, occupational, and educational data.

2. The graduates provided accurate perceived data on how to improve the questionnaire for future follow-up studies.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this study was to develop and evaluate a model for conducting a follow-up study of technician program graduates. Several follow-up studies related to post-secondary school technician have been conducted, most of them directed towards the evaluation of specific occupational programs. Institutions which offer technician education programs have for many years considered graduate follow-up studies as an essential part of program evaluation.

All of the studies reviewed are related in some aspect to the present study, and the review of literature pertinent to the background of this study is separated into three broad categories: 1) the technician, 2) pertinent technical program follow-up studies, and 3) studies related to procedures for designing survey instruments.

The Technician

Technician education, technology, technical training, technician and various other terms have been used rather loosely to indicate a certain level of education. There seems to be considerable confusion surrounding the definitions and few can agree on a definition unless it is stated in rather broad and general terms.

Phillips (1964) describes what the technician does. He stated:

> . . . Technicians in the labor force today have received their training in a number of different ways. Technician training programs are found in industry, the armed forces, and educational institutions. Opportunities for technical training are found in various kinds of educational institution, high schools, junior college or community colleges and technical institutes (p. 1).

Most of the institutions mentioned in the previous quote are generally well understood except perhaps the technical institute. Roney (1964) has defined the technical institute as follows:

> . . . The Technical Institute is a post high school institution offering training for occupations in which emphasis is placed on the application of the functional aspects of mathematics and science, or an officially designated, separately organized technical institute division of a four-year institution. The primary purpose of the technical institute is training for an objective other than the baccalaureate degree (p. 9).

The United States Bureau of Labor Statistics (1958) in the publication, Employment Outlook for Technicians, provides a descriptive statement of the technician as follows:

> . . . The term 'technician' is used to describe a large and loosely defined group of occupations at many levels of skill and with a wide variety of training requirements. In general, technician jobs fall between those of the skilled craftsman and the professional engineer or scientists. The work is technical in nature but narrower in scope than that of the engineer or scientist and has a practical rather than a theoretical orientation. Frequently technician jobs require use of complex electronic and mechanical instruments, experimental laboratory apparatus, drafting instruments, tools, and machinery. Almost all technicians must be able to use engineering handbooks and computing devices such as the slide rule or calculating machines (p. 1).

Roney (1960), in a publication of the United States Department of Health, Education, and Welfare, Occupational Criteria and Preparatory Curriculum Patterns in Technical Education Programs, makes certain

assertions as to special abilities needed in a technician, and lists the following:

1. Proficiency in the use of the disciplined and objective scientific method of inquiry and observation and in the application of the basic principles, concepts, and laws of physics, chemistry, and/or the biological science pertinent to the individual's field of technology.

2. Facility with mathematics; ability to use algebra and usually trigonometry as tools in the development, definition, or quantification of scientific phenomena or principles according to the requirements of the technology. Some must have an understanding of, though not necessarily facility in using higher mathematics through analytical geometry, calculus, and differential equations. Some may not even need a knowledge of trigonometry; for example, associate degree nurses.

3. A thorough understanding and facility in use of the materials, processes, apparatus, procedures, equipment, methods, and techniques commonly used to perform the laboratory, field, or clinical work; and the capability to use them to provide the specialized services required in the technology.

4. An extensive knowledge of a field of specialization, with an understanding of the application of the underlying physical or biological sciences as they relate to the engineering, health, agricultural, or industrial processing or research activities that distinguish the technology of the field. The degree of competency and the depth of understanding should be sufficient to enable the individual to establish effective rapport with scientists, and customers, workmen, or patients, and to do detailed scientific or technical work as outlined in general procedures or instructions. It requires individual judgment, initiative, and resourcefulness in the use of techniques, procedures, handbook information, and recorded scientific data or clinical practice.

5. Communication skills that include the ability to record, analyze, interpret, and transmit facts and ideas orally, graphically, or in writing with complete objectivity; and to continuously locate and master new information pertinent to the technology. Technicians must be able to communicate easily with all persons involved in their work (p. 3).

In another study, Occupational Education Beyond the High School in Oklahoma, Roney and Braden (1967) propounded a definition of technician education which was subsequently adopted by the Oklahoma Technical Education Council.

> . . . Technical Education is a planned sequence of classroom and laboratory experiences, usually at the post-secondary level, designed to prepare men and women for a range of job opportunities in well identified fields of technology. The program of instruction normally includes study in mathematics, the sciences inherent in a technology, and selected skills, materials, and processes commonly used in the technology. Complete technical education programs provide intensive training in a field of specialization, and include basic communication skills as well as general education studies. Instruction in technical programs gives major emphasis to principles rather than to specific techniques or skills. Industrial applications of these principles are used wherever possible in the instructional program. The technical curriculum should prepare the graduate to: 1) obtain a job, 2) be a productive employee with a minimum of additional on-the-job training, 3) advance with the developments in the technology, and 4) continue his education through extension or other supplementary training programs (p. 9).

Pertinent Follow-Up Studies in Technical Program

Whitt (1957, p. 3) stated that "follow-up" studies are one of the most important means available in the evaluation of any educational program.

Holman (1968, p. 4) presented the thought that "follow-up studies have a tremendous effect upon education, for it serves as an opening wedge for continuous faculty and improvement in education".

Good (1973) defined the purposes of the follow-up study as follows:

a. To determine the effectiveness of the guidance process,
b. To obtain a realistic picture of what lies ahead for present students,
c. To help formal students reappraise their educational plans,
d. To appraise the school's program,
e. To obtain ideas for improving the program,
f. To obtain information that the school requires to adapt its adult education program to meet more efficiently the needs of its former students and the community, and
g. Evaluation of progress of persons in jobs or training to which they have been assigned, on the basis of certain measuring instruments and procedures (p. 4).

Franchak and Spireer (1978) organized the four major steps pertinent in the design and planning of the follow-up study of formal students to be best constituted in this manner:

A. Systematic development of follow-up study objectives. The development of inadequate follow-up study objectives can be considered one of the major obstacles in conducting successful and effective follow-up of former students.
B. Techniques for the development of survey instruments used to collect information from former students and employers.
   Instrument development involves a series of steps which include:
   1. Determining the questions to be asked,
   2. Developing sex and ethnic equitable language for the instrument,
   3. Increasing the readability of the instrument,
   4. Increasing the readability and validity of the instrument,
   5. Determining the most appropriate format for the instrument,
   6. Determining how to process the instrument.
C. Techniques for insuring that the concerns stemming from the family Education Rights and Privacy Act.
D. Drawing the representative sample (p. 25).

By defining the specific tasks and personnel responsibilities for a follow-up study in the beginning, the chances for a successful effort were greatly increased. Therefore, McKinney and Oglesby (1971) outline, in some detail the procedure for developing and conducting follow-up studies of formal students:

Preparation:

1. Develop objectives for the follow-up study.
2. Determine the group or groups of former students to be involved in the follow-up study.
3. Determine best method of conducting the follow-up study by mailed questionnaire, personal interview, and phone interview.
4. Design questionnaire in consultation with the administrators, teachers, citizens advisory committee, and student committee and board of education.
5. Obtain authorization for use of signatures from teachers or administrators who will be signing alert cards, cover letters, and reminder cards/letters.
6. Obtain addresses of former students.
7. Prepare master address file.

Data Collection:

1. First mailing - alert cards.
2. End of first week - second mailing - cover letters and questionnaires.
3. First response analysis by begin running count of returned completed questionnaires, begin search for correct address, and compile address list for third mailing.
4. End of second week - third mailing reminder cards for non-respondents, questionnaires to corrected address (of instruments returned because of incorrect address), continue search for corrected address, and prepare list for fourth mailing.
5. End of third week - fourth mailing by reminder letter and second copy of questionnaire to non-respondents, and continue response analysis.
6. End of the fourth week - fifth and final mailing - reminder card with cut-off date to non-respondents.

Analysis of data:

1. Preparation of follow-up report.
2. Conference with administrators, teachers, citizens, student committee, and board of education.
3. Publication of follow-up report (pp. 28-30).

Studies Related to Procedures for Designing Follow-up Survey Instruments

At this point in reporting literature reviewed, it was felt appropriate to incorporate brief references to a number of studies completed in the area of "follow-up" investigations. Briggs (1977) conducted a follow-up study of former graduates from the College of Arts and Science at Oklahoma State University for the year 1971. Most of the graduates responded that they had held no more than two jobs since leaving Oklahoma State University. The most commonly reported number of jobs held was only one. Briggs' study was helpful in the selection of a questionnaire item.

In a recent study by Chaudhry (1981), a purpose of her questionnaire was to determine the extent to which graduates employed in different occupations utilized their college education. Through a survey questionnaire, graduates who received their undergraduates degrees from the classes of 1970 and 1976 at Oklahoma State University. The respondents expressed their own views on the ways in which their college education contributed to their career development. Conclusions were drawn from responses of two groups of college graduates. Her study provided guidelines for the selection of questionnaire items and analysis for the present study. These graduates were asked about job title, numbers of jobs, and employability. The graduates were also

asked to recommend courses helpful to their job. Thirty percent of respondents did not identify any course.

A few technical education follow-up studies have been done in Oklahoma. Ballard (1969) conducted a follow-up study of the Oklahoma State University technical education graduates from 1960-1968. His study concerned salaries, career information, geographic data, and educational patterns of graduates. Ballard also analyzed questions concerning the choice of technical education programs at Oklahoma State University and the involvement within extra professional activities. He reported that the majority of all Technical Education graduates entered Technical Education because it was the best post-associate degree educational opportunity. And Technical Education graduates pursuing careers in education tended to do more post-graduate study than did Technical Education graduates pursuing careers in industry, business, or military.

A similar study was conducted by Retelonis (1972). His study was a continuation of the follow-up study conducted by Ballard. Rutelonis' purpose was to update past information from technical education graduates in 1960-1968 and to obtain pertinent information from graduates during the years of 1969 through 1972 as well as those graduates who were not included in Ballard's study.

One result of Rutelonis' study concerned the respondents of Ballard's study who indicated that they intended to pursue an advanced degree. It was found that during the four-year span from 1968 through 1972 only 23.5 percent of 64 respondents actually had pursued an advanced degree. Some consideration to program improvement was explored by Rutelonis. Respondents were asked what additional course work should be included in the technical education curriculum. Most of the

respondents preferred more technical and business courses.

Roberts (1976) conducted a similar study to Ballard and Rutelonis. His study collected and analyzed follow-up data on graduates of the technical education Bachelors degree and Masters degree programs of Oklahoma State University. The findings of this study indicated that graduates working in education related fields are found to be more active in seeking advanced degrees. Over half of the graduates in both education and in industry have changed employment since their first job. Graduates were asked what additional course or courses would have been beneficial to them. Industry-employed listed business and computer science courses, and the education-employed felt that more coursework in educational administration and technical specialty courses was needed.

Summary

The focus of most evaluation efforts should be on the product or the output of the educational system. This emphasis on the output of the educational system means that we need to look at the former students of that system to assist in determining the effects of the educational system on the former students. One of the ways of securing information about former students is to conduct a follow-up study of the former students (McKinney and Oglesby, 1971).

Institutions offering technician education programs have for many years considered graduate follow-up studies as an essential part of program evaluation. This technique is employed not only for self-evaluation purposes, but the follow-up data is often required by local, state, and federal agencies which support the institutions. These

agencies are usually interested in such things as: graduate employment and unemployment, job titles, and salaries (Roberts, 1976).

In previous research, technical education studies have dealt with job titles, job satisfaction, career patterns, salary analysis, and curriculum development.

CHAPTER III

METHODOLOGY

The purpose of this study was to develop and evaluate a model for conducting a follow-up study of technician program graduates during the years 1976 through 1980. This chapter describes the methodology used to achieve the objectives of the study. This study involved the graduates who received an Associate degree or the equivalent in automotive and electronic technology programs at Oklahoma State University School of Technical Training at Okmulgee, Texas State Technical Institute at Waco, and four of 28 Institutes of Technology and Vocational Education in Thailand.

Graduate Follow-Up Model Used

An outline of the initial model used is given below:

I. Preparation

1. Develop follow-up study objectives.
2. Identify population of graduates to be included in follow-up study.
3. Develop a self-administered mailed questionnaire.
4. Obtain addresses of graduates and prepare master address file.
5. Establish mailing dates and prepare material for mailing.

II. Data Collection

1. First mailing -- send transmittal letter and questionnaire to selected population.

2. Second mailing -- send follow-up letter with questionnaire to the graduates who do not respond to the original request.

3. First response analysis -- run count of returned and completed questionnaires.

4. End of four weeks -- make telephone call to non-respondents.

III. Data Analysis

1. Analyze personal data by percentage and average.

2. Analyze occupational data by percentage and average.

3. Analyze educational data by percentage and average.

IV. Dissemination Results

1. Send abstract to all concerned individuals, departments, and agencies.

2. Send copy of entire follow-up study to selected individuals, departments, and agencies.

A copy of the initial questionnaire is presented in Appendix A (English version) and Appendix B (Thai version).

This chapter is divided into the following sections: 1) population, 2) instrumentation, 3) collection of data, and 4) data analysis.

Population

The populations in this study were preclassified according to one of two groups: 1) those who graduated in automotive and electronics technology in the United States from 1976 through 1980, and 2) those who graduated in automotive and electronics technology from the four ITVE campuses in Thailand from 1976 through 1980. Two large residential technical institutes in neighboring states which offer several

technician programs were selected as a base for the population in the United States.

A random sampling procedure was used to select the sample for each of the two technical institutes in the United States. The total number of the graduates from the Oklahoma State University School of Technical Training (OST) automotive and electronics technology programs from 1976 through 1980 was 1,269. The total number of the graduates from the Texas State Technical Institute (TSTI) automotive and electronics technology programs graduates at Waco was 468. Names and mailing addresses of the automotive and electronics technology graduates from Oklahoma State University School of Technical Training and Texas State Technical Institute, Waco, were obtained from the respective departmental files.

Four Institute of Technology and Vocational Education campuses in Thailand were selected by the researcher because they offer several technician programs and one is located in each of the four geographical regions of the country. The location of these four institutes can be seen in the map presented in Figure 1. The four institutes were:

1. Institute of Technology and Vocational Education, Bangkok Campus, Bangkok, Thailand.
2. Institute of Technology and Vocational Education, Northern Campus, Chiang Mai, Thailand.
3. Institute of Technology and Vocational Education, Northeastern Campus, Nahorn Rajsima, Thailand.
4. Institute of Technology and Vocational Education, Southern Campus, Songkla, Thailand.

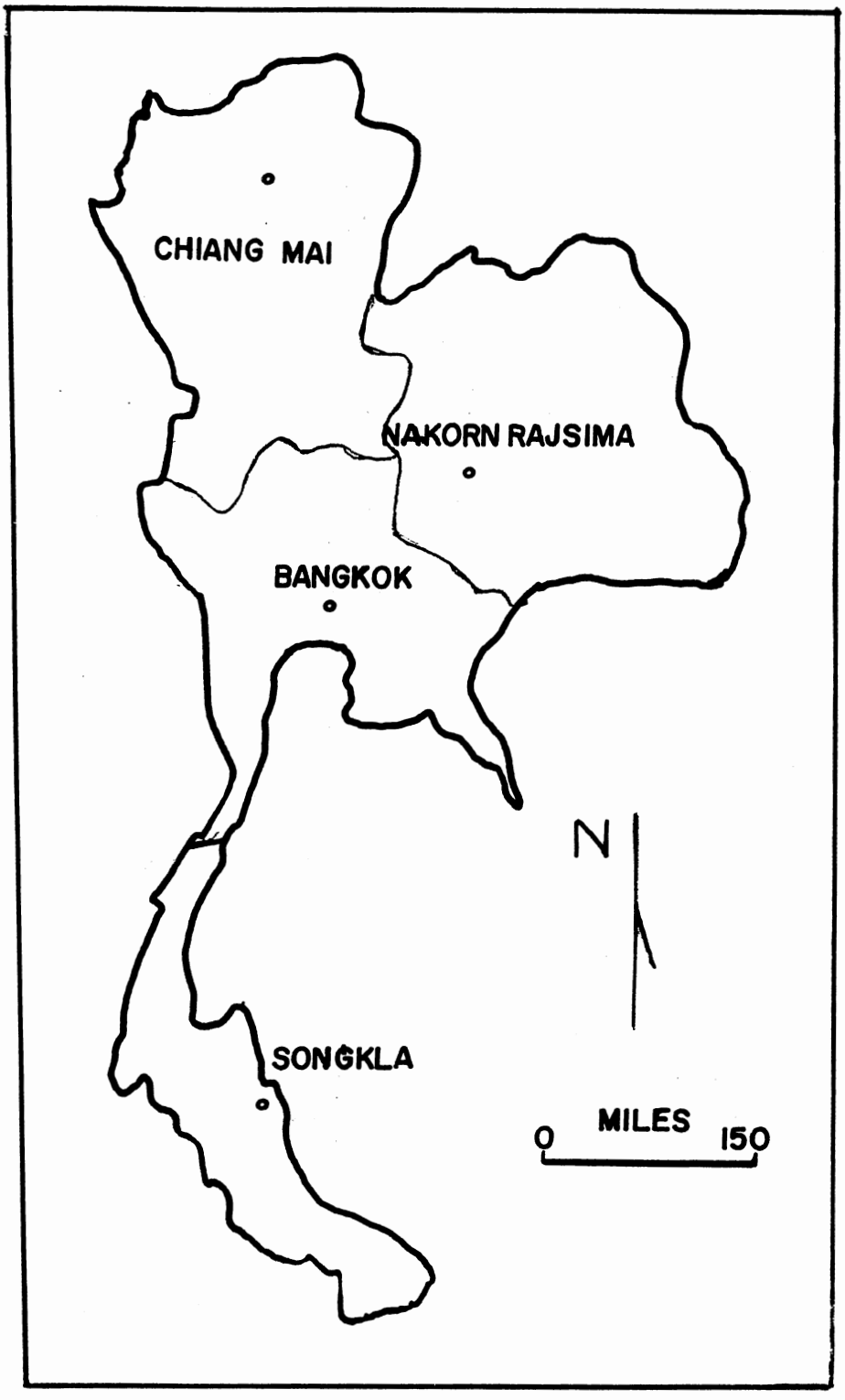

Figure 1. Four Campus Sites of the Institute of Technology and Vocational Education in Thailand

The number of the graduates by year and by program from each of the six technical institutes from 1976 through 1980 is presented in Table I. The total number of automotive graduates from the two technical institutes in the United States was 734. And 1,003 of the total number were electronics graduates. A random sampling technique was used to select the samples in each of the two technical institutes in the United States. There were a total of 475 automotive graduates from OST, 125 (26.3%) were randomly selected for participation in this study. In addition, from the total of 794 electronics graduates from OST, 125 (15.7%) were randomly selected to receive questionnaires. From the total of 259 automotive graduates from Texas State Technical Institute (TSTI), 125 (48.3%) were randomly selected to participate. One hundred twenty-five (59.8%) graduates were randomly selected from the total of 209 electronics graduates from TSTI.

The Thailand population consisted of all graduates who received the equivalent of an Associate degree from Thailand technical institutes who had majored in automotive and electronics technology from 1976 through 1980. The total number of graduates completing automotive technology was 562 and total number of electronics technology graduates during the five year period was 562. The names and mailing addresses of the graduates of automotive and electronics technology programs of both in the United States and Thailand were obtained from the personnel files in the departmental offices. In the United States the questionnaire was mailed directly to the selected sample and was returned by them. But in Thailand instructors in both program departments at each of the four Thai technical institutes assisted in the distribution and collection of the completed questionnaires.

TABLE I

NUMBER OF GRADUATES BY YEAR AND PROGRAM FROM EACH OF THE SIX TECHNICAL INSTITUTES

	1976		1977		1978		1979		1980		TOTAL	
Technical Institutes	Auto.	Elect.	Auto.	Elect.	Auto.	Elect.	Auto.	Elect.	Auto.	Elect.	Auto.	Elect.
Oklahoma State Tech. Okmulgee	88	173	104	154	115	168	98	146	70	153	475	794
Texas State Tech. Institute, Waco	5	28	67	28	72	42	72	47	43	64	259	209
ITVE* Bangkok Campus	25	21	32	31	33	35	33	32	42	45	165	164
ITVE Chiang Mai Campus	25	21	24	28	25	30	33	40	41	40	148	159
ITVE Nakhorn Rajsima Campus	22	20	22	25	21	24	30	26	30	30	126	125
ITVE Songkla Campus	22	20	22	17	25	23	26	26	28	28	123	114

*Institute of Technology and Vocational Education

Instrumentation

The instrument developed for this study was structured to seek solutions to the problem, and attain the previously stated purpose. A self-administered mailed questionnaire was used in this study.

The questionnaire items and data processing procedures were developed in collaboration with the members of the doctoral study committee. After reviewing several other follow-up studies of graduates and considering the information to be investigated in this study, a questionnaire was designed to be completed by the graduates with a minimum of effort. A majority of the questions required short written answers, others required a check mark. However, open-ended questions were used in some cases to allow for individualized responses. The questions were incorporated into a three-page questionnaire. A copy of the questionnaire translated into the Thai language is included in Appendix B.

Collection of the Data

In order to obtain data representative of the graduates of technical institutes in the United States, a letter was created to explain the purpose of the study. This letter was sent to each of the graduates in selected population from Oklahoma State University School of Technical Training's automotive and electronics technology programs from 1976 to 1980. The names of the graduates were individually typed on each letter and each individual letter was signed by the researcher. No letterheads were used. While a letterhead might have promoted maximum response by indicating legitimate authority, this might have caused the respondents to reply in a manner which might have protected

their personal interests. A copy of a transmittal letter which has no letterhead is included in Appendix C. The letter, questionnaire, and a stamped self-addressed return envelope were mailed to each graduate of OST meeting the criteria of this study.

A letter explaining the purposes of the study and requesting their participation was created and sent to TSTI graduates of the automotive and electronics technology programs. According to instructors at TSTI, a problem had previously occurred when their graduates had received requests to complete follow-up questionnaires from their technical institute. The letterhead of Oklahoma State University School of Occupational and Adult Education (OAED) was used in this case. The names of the graduates were individually typed on each letter, and each individual letter was signed by the researcher. The letter, questionnaire, and a stamped self-addressed return envelope were mailed to each person in the study population from TSTI. A copy of the letter with the OAED letterhead for automotive technology graduates is included in Appendix D. A copy of the letter with the OAED letterhead for electronics technology graduates is included in Appendix E.

After a period of four weeks, a follow-up letter was written and mailed along with another questionnaire to OST and TSTI graduates who had not responded to the original. A copy of the follow-up letter can be seen in Appendix F.

The Thai questionnaire was mailed in Thailand to each of the automotive and electronics technology graduates from 1976 to 1980 of the four selected ITVE schools. Included with the questionnaire was a letter of transmittal, a copy of which appears in Appendix G.

A Thai government letterhead was used to promote maximum response in Thailand. It was approved by the Rector of the Institute of Technology and Vocational Education. A letter, questionnaire, and a stamped self-addressed return envelope were mailed to each graduate in the Thai population. The returned questionnaires were collected by the instructors of each selected program at the four Institutes of Technology and Vocational Education representing all four central geographical regions of the country. Completed questionnaires were then sent to the researcher in the United States.

A follow-up letter was formulated in the United States, and translated and typed in the Thai language, and was mailed to all Thailand non-respondents. After a period of four weeks an additional questionnaire and a stamped self-addressed envelope was included with each follow-up letter. A copy of the follow-up letter typed in the Thai language can be found in Appendix H.

Data Analysis

Data from the questionnaires are divided into three different areas: 1) personal data, 2) occupational data, and 3) educational data.

The data was processed by tabulating the responses and presenting them in percentage and averages. Frequency and percentage analysis was sufficient to deal with data from the two technical institutes in the United States and the four Institutes of Technology and Vocational Education campuses in Thailand. Not all items in the questionnaire were completed by the graduates, therefore, on computing the percentages for any one item, only those questionnaires which included a response for that one item were utilized.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to develop and evaluate a model for conducting a follow-up study of technician program graduates. This study involved the graduates of automotive and electronics technology programs at Oklahoma State University School of Technical Training, Texas State Technical Institute at Waco, and four campuses of the Institute of Technology and Vocational Education in Thailand during the years 1976 through 1980. The data presented in this chapter are arranged under the following subheadings: 1) return rates, 2) personal data, 3) occupational data, and 4) educational data.

Return Rates

The data shown in Table II illustrate the selected sample for each program at each school and the number of responses from graduates of each institute by program. Twenty-eight (21.8%) of the sample of the OST automotive technology graduates responded to the questionnaire. Similarly, 28 (21.8%) of the sample of TSTI automotive technology graduates responded to the questionnaire. Thirty-two (25.6%) of OST electronics technology graduates responded to the questionnaire. Of the selected samples from the four Institute of Technology and Vocational Education campuses in Thailand, the highest number of respondents from automotive technology were graduates of the Chiang Mai campus with

TABLE II

SURVEY SIZE AND QUESTIONNAIRE RETURN RATE OF GRADUATES BY INSTITUTE AND PROGRAM

Technical Institute	Survey Size		Number of Returned Questionnaires		Percent of Returned Questionnaires	
	Auto.* N	Elec.** N	Auto.* N	Elec.** N	Auto.* %	Elec.** %
Okla. State Tech., Okmulgee	125	125	28	32	21.8	25.6
Texas State Tech. Inst., Waco	125	125	28	34	21.8	27.2
ITVE+ Bangkok Campus	165	164	101	77	61.2	46.9
ITVE+ Nakhorn Rajsima Campus	126	125	66	58	52.4	46.4
ITVE+ Songkla Campus	123	114	53	59	43.1	51.7

*Automotive
**Electronics
+Institute of Technology and Vocational Education

95 (64.2%) of the questionnaires returned. This was followed by the campuses of Bangkok, Nakhorn Rajsima, and Songkla with 101 (61.2%), 66 (52.4%) and 53 (43.1%) respondents, respectively.

The highest percentage of respondents in electronics technology came from the Songkla campus with 59 (51.7%) respondents, followed by Chiang Mai, Bangkok, and Nakhorn Rajsima with 80 (50.3%), 77 (46.9%), and 58 (46.4%) respondents, respectively.

Personal Data

The data in Table III indicates the tendency of some graduates to move to another state or province after their graduation. The data in Table III revealed that of the OST respondents, 7 (25.0%) of the automotive graduates and 11 (34.4%) of the electronic graduates migrated out of the state of Oklahoma while 21 (75.0%) of the automotive graduates remained in the state. Of the TSTI graduate respondents, only 1 (3.6%) of the automotive graduates and 4 (11.8%) of the electronics graduates migrated out of the state of Texas while 27 (96.4%) of the automotive graduates and 30 (88.2%) of the electronic graduates remained in Texas.

Of the ITVE Bangkok campus graduates, 6 (6.0%) of the automotive graduates and 5 (6.5%) of the electronic graduates migrated out of Bangkok to other places in Thailand. However, 95 (94%) of the automotive graduates remained in Bangkok. Of the ITVE Chiang Mai campus graduates, 8 (8.4%) of the automotive graduates and 6 (7.5%) of the electronics graduates migrated out of Chiang Mai to places in Thailand. However, 87 (91.6%) of the automotive graduates and 74 (92.5%) of the electronics graduates remained in Chiang Mai. Of the ITVE Nakhorn

TABLE III

EMPLOYMENT LOCATION OF GRADUATES OF AUTOMOTIVE AND ELECTRONICS PROGRAMS BY INSTITUTE

Employment Location		Automotive		Electronics	
		N	%	N	%
OST:	Out of State	7	25.0	11	34.4
	In State	21	75.0	21	65.6
TSTI:	Out of State	1	3.6	4	11.8
	In State	27	96.4	30	88.2
ITVE - Bangkok Campus:					
	Out of Province	6	6.0	5	6.5
	In Province	95	94.0	72	92.5
ITVE - Chiang Mai Campus:					
	Out of Province	8	8.4	6	7.5
	In Province	87	91.6	74	92.5
ITVE - Nakhorn Rajsima Campus:					
	Out of Province	7	10.6	6	10.4
	In Province	59	89.4	52	89.6
ITVE - Songkla Campus:					
	Out of Province	6	11.3	5	8.5
	In Province	47	88.7	54	91.5

Rajsima campus graduates, 7 (10.6%) of the automotive graduates and 6 (10.4%) of the electronics graduates migrated out of Nakhorn Rajsima to other places in Thailand. However, 59 (89.4%) of the automotive graduates and 52 (89.6%) of the electronics graduates remained in Nahorn Rajsima. Of the ITVE Songkla campus graduates, 6 (11.3%) of the automotive graduates and 5 (8.5%) of the electronics graduates migrated out of Songkla to other places in Thailand. Forty seven (88.7%) of the automotive graduates and 54 (91.5%) of the electronics graduates remained in Songkla.

Occupational Data

The occupational data are presented in Table IV and Table V. Not all of the items in the questionnaires received responses. Therefore, on computing the percentages for any one item, only those questionnaires which included a response for that item were utilized.

The data presented in Table IV indicates the number of jobs held since graduation by program and technical institute. Of the 28 automotive graduates from OST who responded to the questionnaire, 8 (28.6%) indicated that they had held only one job while 20 (71.1%) indicated that they had held at least two jobs since graduation. Of the 28 automotive respondents from TSTI, 19 (67.9%) indicated that they had held only one job and 9 (32.1%) had held at least two jobs since graduation. Of the 288 automotive respondents from the four ITVE campuses, 244 (84.7%) indicated that they had held only one job and 44 (15.3%) had held at least two jobs. Also, of the 32 electronics graduates from OST, 17 (53.1%) indicated that they had held only one job while 15 (46.9%) had held at least two jobs. Of the 34 electronic respondents

TABLE IV

NUMBER OF JOBS GRADUATES HELD BY PROGRAM AND BY INSTITUTE

	Automotive				Electronics			
	One job		At least two jobs		One job		At least two jobs	
Technical Institutes	N	%	N	%	N	%	N	%
Okla. State Tech., Okmulgee	8	28.6	20	71.1	17	53.1	15	46.9
Texas State Tech. Inst., Waco	19	67.9	9	32.1	22	64.7	12	35.3
ITVE* Bangkok Campus	77	82.8	16	17.2	58	82.9	12	17.1
ITVE Chiang Mai Campus	71	82.6	15	17.4	64	86.5	10	13.5
ITVE Nakhorn Rajsima Campus	53	88.3	7	11.7	43	81.1	10	18.9
ITVE Songkla Campus	43	87.8	6	12.2	42	79.2	11	20.8

* Institute of Technology and Vocational Education

from TSTI, 22 (64.7%) indicated that they had held only one job while 12 (35.3%) had held at least two jobs. Of the 250 electronics respondents from the four ITVE campuses, 207 (82.8%) indicated that they had held only one job and 43 (17.2%) had held at least two jobs. The data show that 45.9% of the United States graduates and 14.7% of the four ITVE campuses changed jobs after they received the Associate degree or its equivalent. A majority of the respondents in the United States and in Thailand are still working at their first job.

The data presented in Table V pertains to the association between the graduates' present occupation and the specific technical program which they had completed. The findings revealed that 25 (89.5%) of the 28 automotive respondents from OST indicated that they held their present jobs either in automotive technology or in a closely related field with only 2 (7.1%) employed in unrelated fields. Only one graduate responded that he was unemployed. All of the automotive respondents from TSTI indicated that they held their present jobs in automotive technology or a closely related field. Thirty (93.7%) of the 32 electronics respondents from OST indicated that they held their present jobs either in electronics technology or a closely related field with only 2 (6.3%) employed in an unrelated field. All of the electronics respondents from TSTI indicated that they held their present jobs either in electronics technology or in a closely related field. In Thailand, of the 315 automotive respondents from the four campuses, 246 (83.8%) of the graduates responded that they held their present jobs either in automotive technology or in a closely related field while 22 (7.0%) were employed in unrelated fields. Twenty-nine (9.2%) graduates responded that they were unemployed. Of the 274 electronics respondents,

TABLE V

ASSOCIATION BETWEEN PRESENT OCCUPATION OF GRADUATE AND TECHNICAL PROGRAM STUDIED

	Automotive Technology						Electronics Technology					
	Speciality/ Related		Not Related		Unemployed		Speciality/ Related		Not Related		Unemployed	
Technical Institute	N	%	N	%	N	%	N	%	N	%	N	%
Okla. State Tech., Okmulgee	25	89.3	2	7.1	1	3.6	30	93.7	2	6.3	--	---
Texas State Tech Inst., Waco	28	100.0	--	---	--	---	34	100.0	--	---	--	---
ITVE* Bangkok Campus	84	83.2	7	6.9	10	9.9	66	85.7	4	5.2	7	9.1
ITVE Chiang Mai Campus	81	85.3	5	5.3	9	9.4	70	87.5	3	3.7	7	8.8
ITVE Nakhorn Pathom Campus	55	83.3	5	7.6	6	9.1	47	81.0	6	10.4	5	8.6
ITVE Songkla Campus	44	83.0	5	9.4	4	7.6	48	81.3	5	8.5	6	10.2

*Institute of Technology and Vocational Education

231 (84.3%) of the graduates responded that they held their present jobs in electronics technology or in a closely related field while 18 (6.6%) were employed in unrelated fields. Twenty-five (9.1%) of the graduates responded that they were unemployed.

Salaries

Figure 2 presents information on the starting salaries of the 1976 through 1980 automotive graduates of the two technical institutes in the United States. The graph revealed that 64.2% of OST respondents had starting salaries less than $16,000 per year while 78.4% of the TSTI automotive respondents had starting salaries less than $16,000 per year.

Figure 3 presents information on the starting salaries of the 1976 through 1980 electronics graduates of the two technical institutes in the United States. The graph revealed that 68.7% of OST respondents had salaries less than $16,000 per year while 56.1% of the electronics respondents from TSTI had starting salaries less than $16,000 per year.

Figure 4 shows information on the current salaries of the 1976 through 1980 automotive graduates of the two technical institutes in the United States. The graph revealed that 25% of the OST automotive respondents had current salaries of less than $18,000 per year while the rest (75%) of the TSTI electronics respondents had current salaries of less than $18,000 per year.

Figure 5 presents information on the current salaries of the 1976 through 1980 electronics graduates of the two technical institutes in the United States. The graph revealed that 22.0% of the OST respondents had current salaries of less than $18,000 per year while 14.6% of TSTI

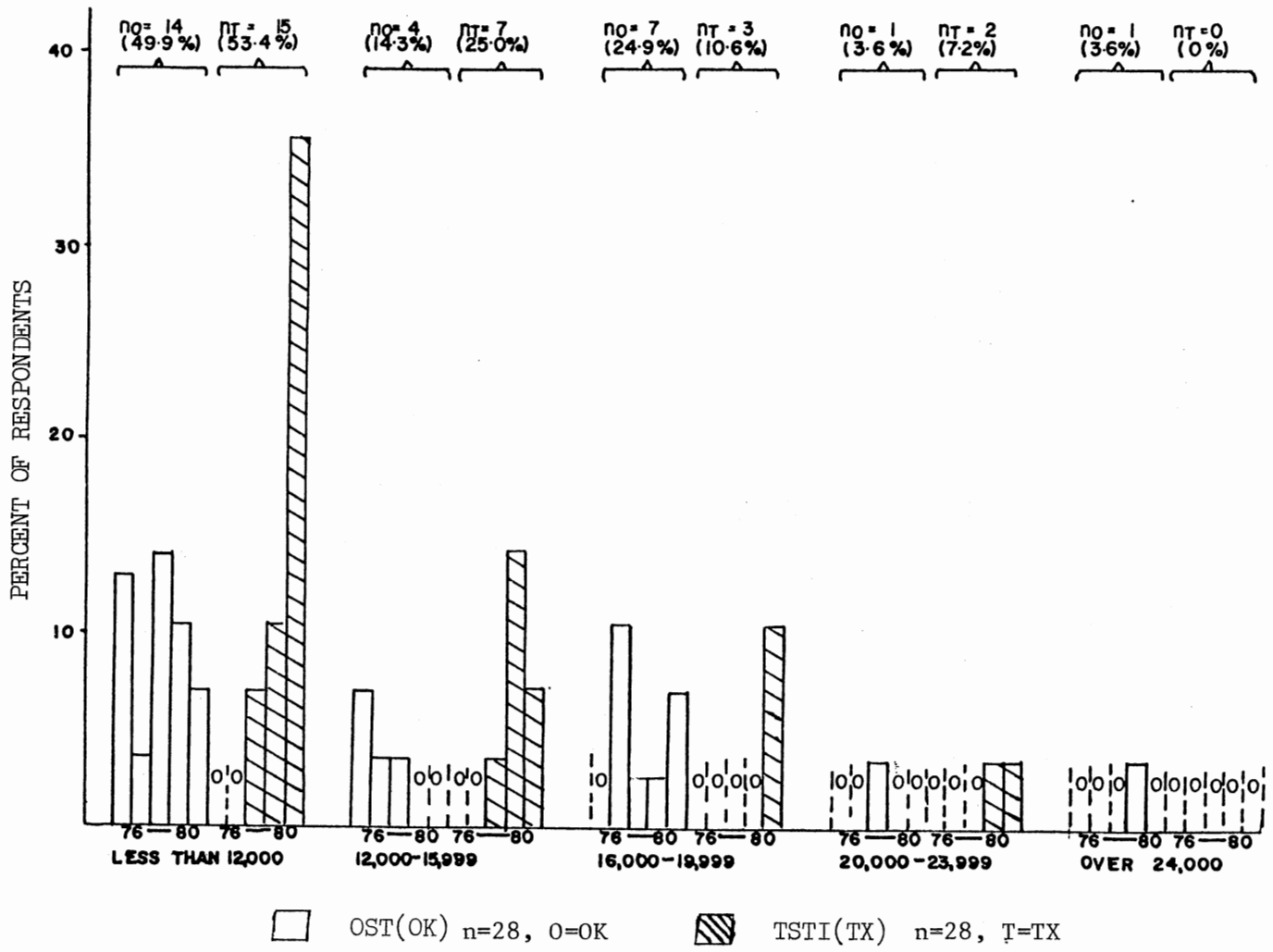

Figure 2. Starting Annual Salaries in U.S. Dollar of United States Technical Institutes Automotive Graduates from 1976 - 1980

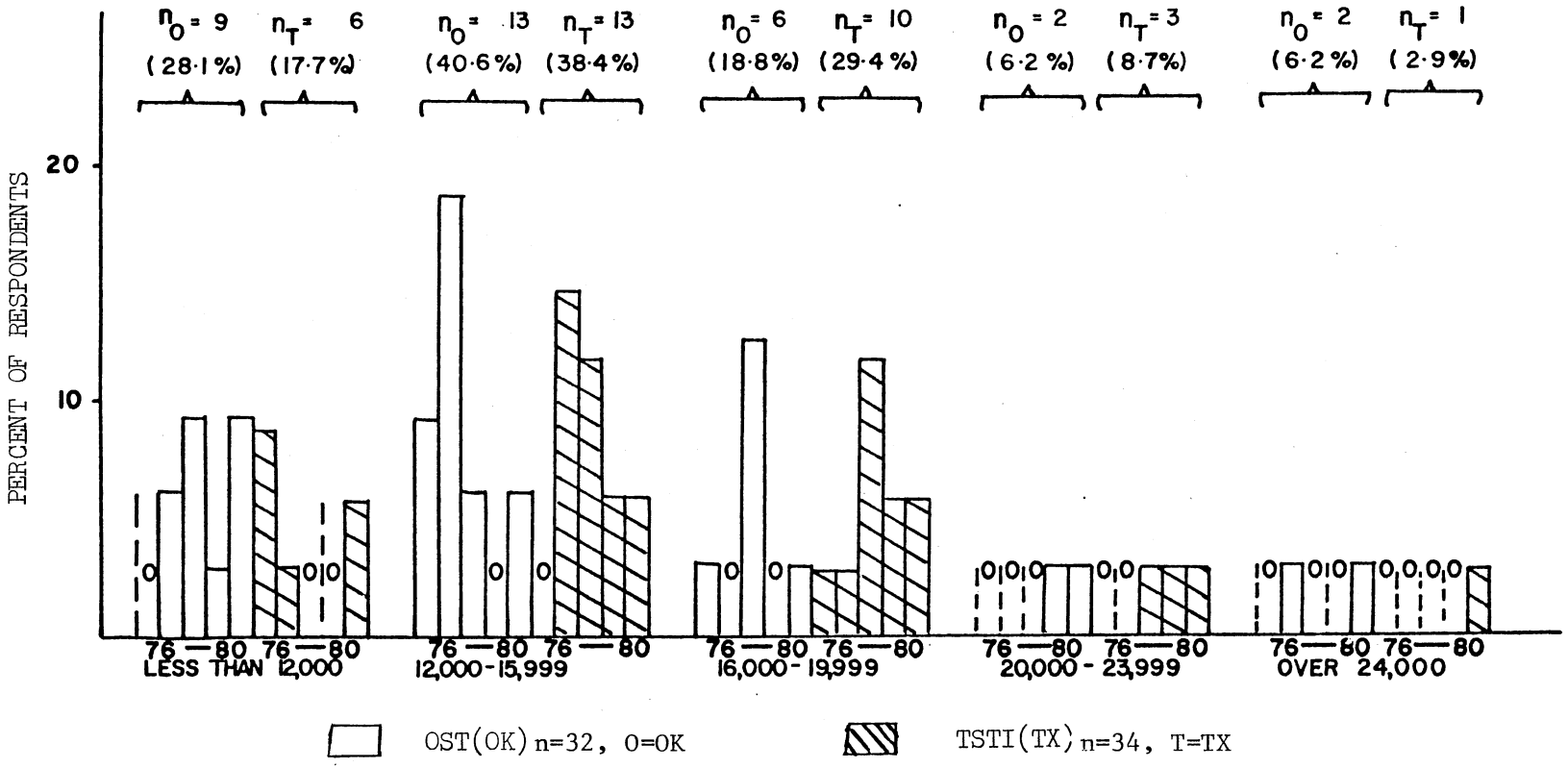

Figure 3. Starting Annual Salaries in U.S. Dollar of United States Technical Institutes Electronics Graduates from 1976 - 1980

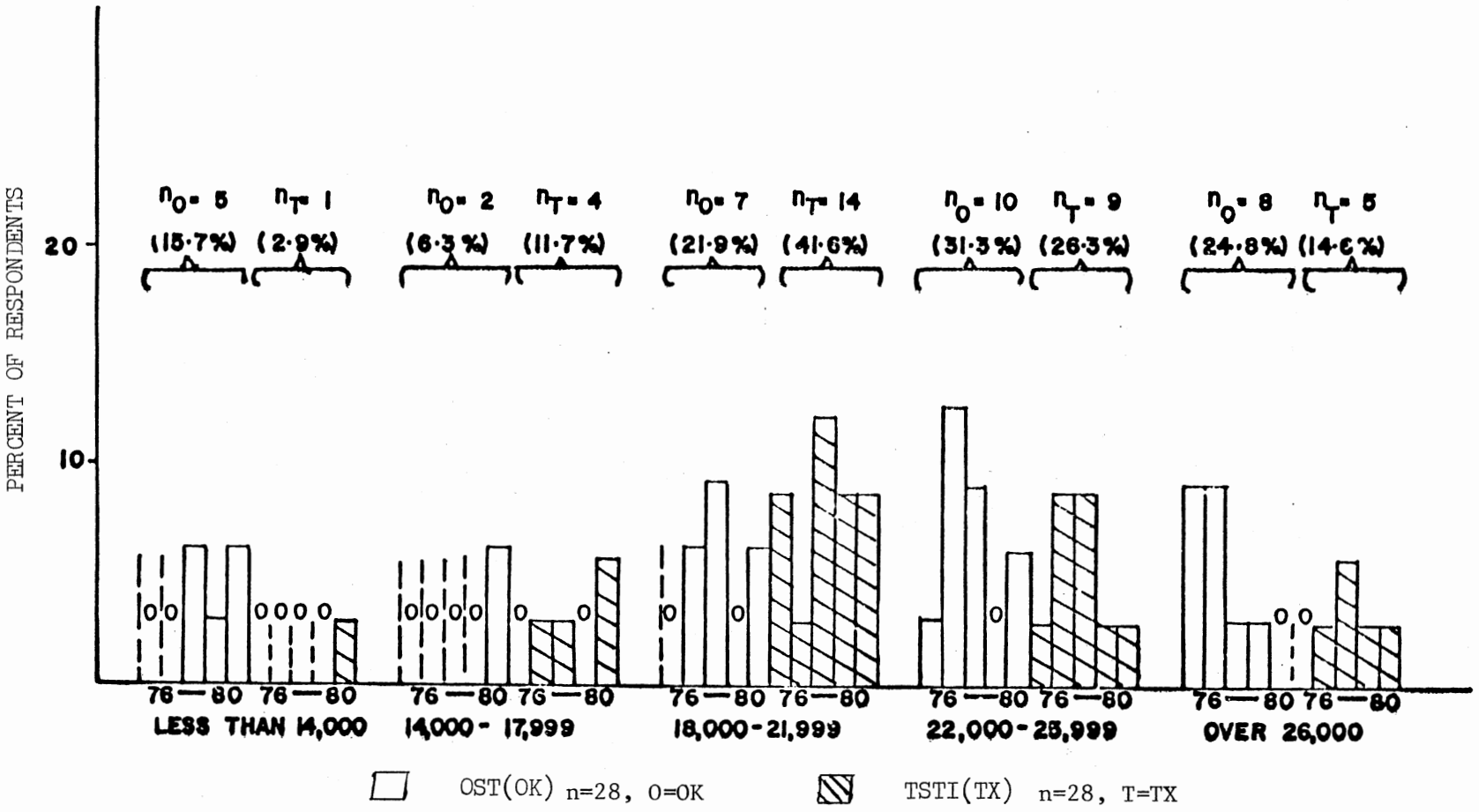

Figure 4. Present Annual Salaries in U.S. Dollars of U.S. Technical Institutes Automotive Graduates from 1976 - 1980

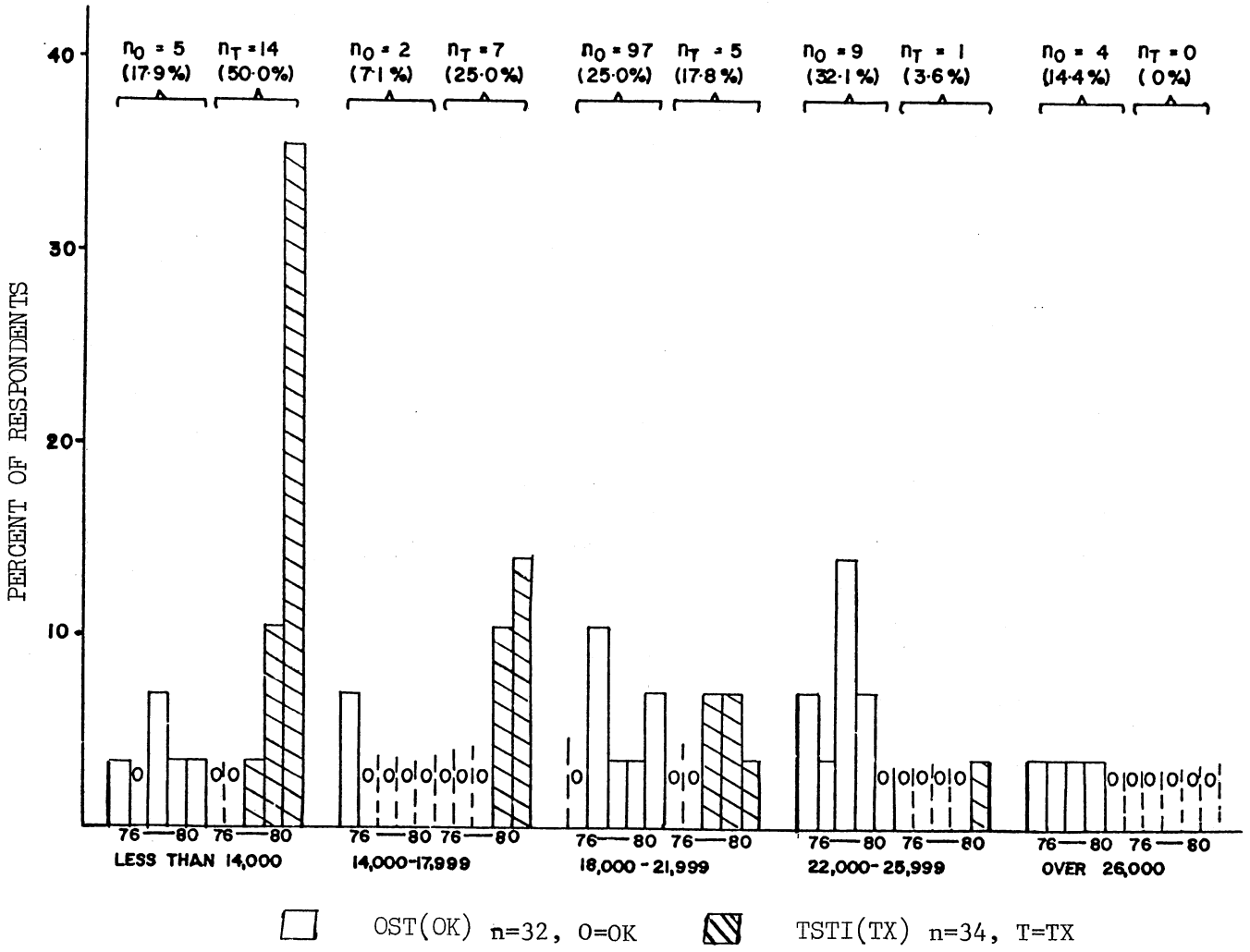

Figure 5. Present Annual Salaries in U.S. Dollars of United States Technical Institutes Electronics Graduates from 1976 - 1980

electronics respondents had current salaries of less than $18,000 per year.

Figure 6 presents information on the starting salaries of 1976 through 1980 automotive graduates from the four ITVE campuses in Thailand. Data from the graph shows that 79.2% of those at the Bangkok campus had starting salaries of less than 3,450 Baht. In addition, 77.9% of those at the Chiang Mai campus, 74.8% of those at Nakhorn Rajsima campus, and 75.7% of those at Songkla campus had starting salaries of less than 3,450 Baht per month.

Figure 7 shows information on the starting salaries of 1976 through 1980 electronics graduates from the four ITVE campuses in Thailand, The graph revealed that 82.8% of the respondents from the Bangkok campus, 80.8% of the respondents from the Chiang Mai campus, 77.4% of the respondents from Nakhorn Rajsima campus, and 79.4% of the respondents from Songkla campus had starting salaries less than 3,450 Baht per month.

Figure 8 shows the current salaries of automotive graduates from the four ITVE campuses in Thailand from 1976 through 1980. The graph indicated that 73.8% of the respondents from the Bangkok campus, 66.1% of the respondents from the Chiang Mai campus, 86.6% of the respondents from Songkla campus had current salaries of between 3,450 to 5,750 Baht per month.

Figure 9 shows the current salaries of electronic graduates from the four ITVE campuses in Thailand from 1976 through 1980. The graph revealed that 75.7% of the Bangkok campus respondents, 75.3% of the Chiang Mai campus respondents, 81.1% of the Nakhorn Rajsima campus respondents, and 84.9% of the Songkla campus respondents have present salaries between 3,450 Baht to 5,750 Baht per month.

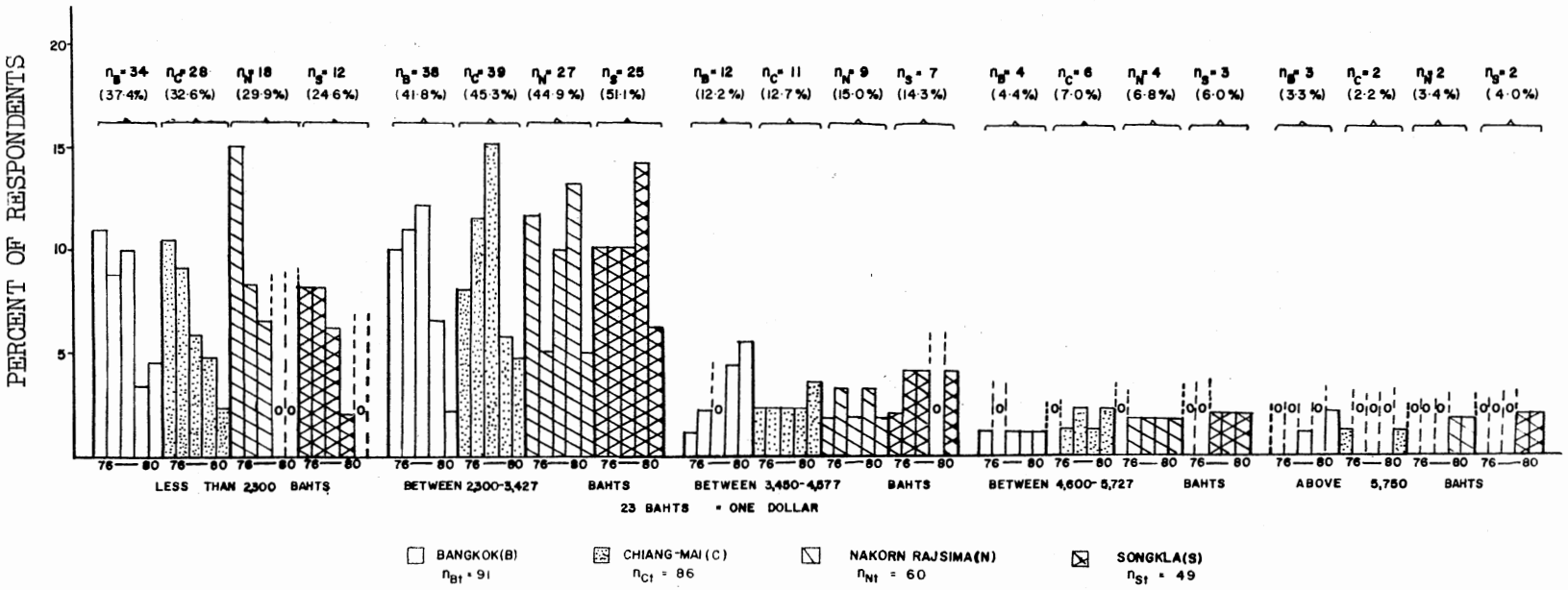

Figure 6. Starting Salaries of Thailand Technical Institutes Automotive Graduates from 1976 - 1980

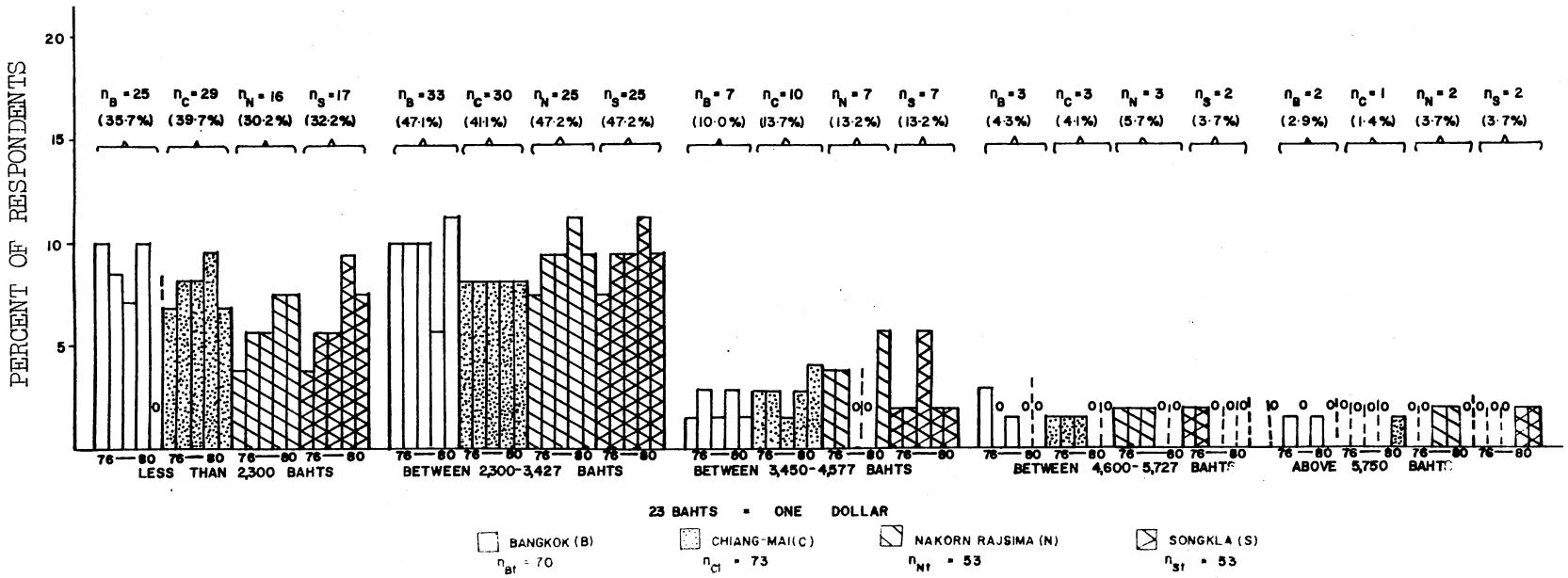

Figure 7. Starting Monthly Salaries of Thailand Technical Institutes Electronics Graduates from 1976 - 1980

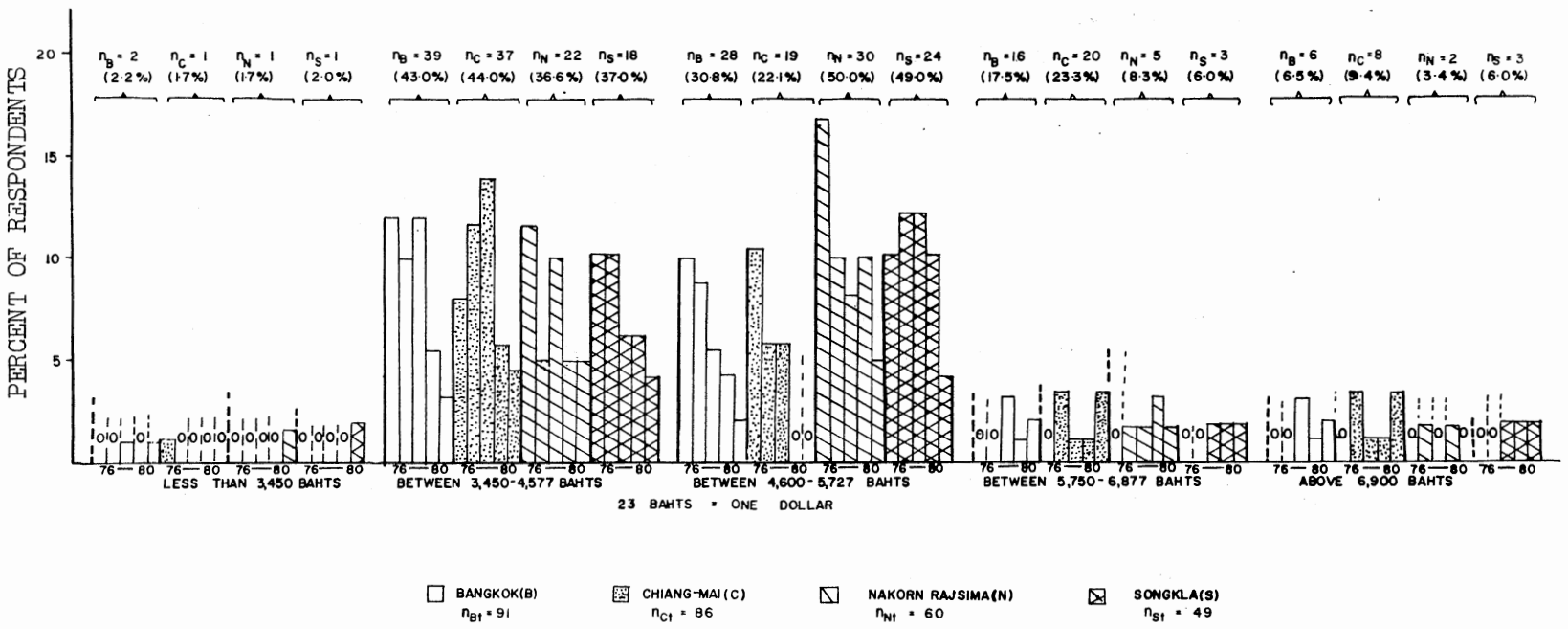

Figure 8. Present Monthly Salaries of Thailand Technical Institutes Automotive Graduates from 1976 - 1980

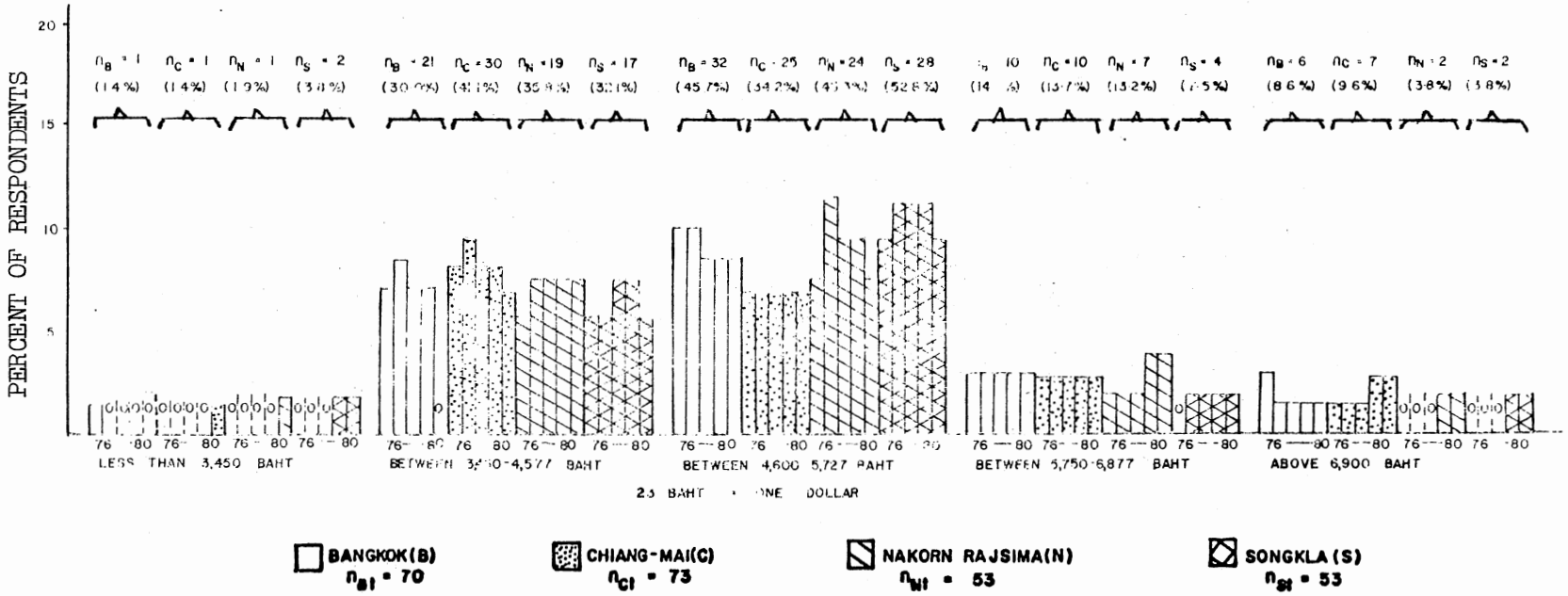

Figure 9. Present Monthly Salaries of Thailand Technical Institutes Electronics Graduates from 1976 - 1980

Educational Data

The data shown in Table VI identifies titles of courses which graduates from OST considered to be the most useful for persons employed in automotive technology. The table revealed that 8 out of 28 respondents indicated that all courses in the automotive program had been useful to them. The most frequently identified course was automotive tune-up followed by electrical, and mathematics with 7, 6, and 5 respondents, respectively.

The data presented in Table VII identifies the titles of courses which graduates from OST considered to be most useful for persons employed in electronics technology. Information in the table revealed that 6 out of 31 respondents indicated that digital design, motors and controllers, and industrial code/wiring had been most useful for them. The next most identified courses were electric digital logic with five responses, followed by electronics knowledge with four responses.

The data as presented in Table VIII identify titles of courses which graduates from TSTI considered to be most useful for persons employed in automotive technology. The table reveals that 11 out of 28 respondents indicated that tune-up had been the most useful course for them. The second most common response of the automotive program was courses with eight responses, followed by electrical with seven responses, and carburetion with six responses.

The data as presented in Table IX identifies the titles of courses or activities considered most useful for persons employed in electronics by graduates from TSTI. The table reveals that seven out of 33 respondents indicated that digital courses had been most useful for them.

TABLE VI

TITLES OF COURSES OR ACTIVITIES CONSIDERED MOST USEFUL BY AUTOMOTIVE GRADUATES FROM OKLAHOMA STATE UNIVERSITY SCHOOL OF TECHNICAL TRAINING BY FREQUENCY OF RESPONSE

Number of Responses	Title	Number of Responses	Title
8	All courses	1	Automotive machinist
7	Automotive tune-up	1	Blue print reading
6	Electrical	1	Engine principles
5	Mathematics	1	Human relations
4	Brakes and front ends	1	Metal arts
4	General repair	1	Personnel management
3	Airconditioning	1	Power supplied
3	Welding	1	Small business agent
2	General education	1	Service management
1	Alignment	1	Suspension
1	Auto trim		

TABLE VII

TITLES OF COURSES OR ACTIVITIES CONSIDERED MOST USEFUL BY ELECTRONICS GRADUATES FROM OKLAHOMA STATE UNIVERSITY SCHOOL OF TECHNICAL TRAINING BY FREQUENCY OF RESPONSE

Number of Responses	Title	Number of Responses	Title
6	Digital design	1	Color TV and FM
6	Motors and controllers	1	Digital principles
6	Industrial codewiring	1	Electrical background and welding
5	Electrical digital logic	1	Electrical trouble shooting
4	Electronics knowledge	1	Heating and air-conditioning
3	Instrumentation	1	Mathematics
2	Microprocessor	1	Motor controls and design
2	Technical report writing	1	On-the-job training
2	Human relations	1	Process instrumentation analysis
1	Analysis design	1	Power supply
1	Basic radio	1	Refrigeration
1	Black and white television	1	Transistor design

TABLE VIII

TITLES OF COURSES OR ACTIVITIES CONSIDERED MOST USEFUL FOR THEIR PRESENT JOB AS PERCEIVED BY AUTOMOTIVE GRADUATES FROM TEXAS STATE TECHNICAL INSTITUTE BY FREQUENCY OF RESPONSE

Number of Responses	Title	Number of Responses	Title
11	Tune-up	2	Drive trains
8	All courses	2	Engine (rebuilding)
7	Electrical	2	Chemistry I and II
6	Carburetion	2	Fuel and emissions
6	Brake and front ends	1	Heat and Thermodynamics
4	Transmission	1	Part description and functions
4	Air conditioning	1	Internal combustion engines
3	Power train	1	Shop safety
3	General education	1	Mathematics

TABLE IX

TITLES OF COURSES OR ACTIVITIES CONSIDERED MOST USEFUL FOR THEIR PRESENT JOB AS PERCEIVED BY ELECTRONICS GRADUATES FROM TEXAS STATE TECHNICAL INSTITUTE BY FREQUENCY OF RESPONSE

Number of Responses	Title	Number of Responses	Title
7	Digital courses	1	Final project
4	Communication	1	Fundamental air conditioning
3	Operational amplifier	1	Fundamentals of electricity
3	Transistor design	1	Hands-on training
2	Microprocessing	1	Human relations
2	Basic electricity	1	Microcomputer and interfacing
2	Mathematics	1	Microprocessor program
1	Basic DC and AC theory	1	Operational amplifiers
1	Circuit analysis	1	Pulse and switching
1	Computer courses	1	SCR control
1	Digital logic	1	Technical report writing
1	Drafting skills	1	Electromechanical devices
1	Electrical and electronics drafting		

The next most common response was communication with four responses, followed by transistor design and Operational Amplifiers with three responses each.

The data presented in Table X identifies the titles of courses considered least useful for automotive graduates from OST and TSTI. The table reveals that five out of 28 OST respondents indicated that general education had been least useful for them. The next least useful course is business principles with two responses, followed by machine shop, auto transmission, and physics. Four out of 28 TSTI respondents indicated that general education had been least useful to them. The next useful courses are basic engine and mathematics with two responses, followed by manual transmissions, chemistry, and hand tools.

The data presented in Table XI identifies the titles of courses or activities considered least useful for electronics graduates from OST and TSTI. The table reveals that six out of 31 OST respondents indicated that general education had been least useful to them. The next least useful course was electronic communications with two responses, followed by mathematics, business principles and instrumentation. Only three out of the 33 TSTI respondents indicated that communication had been least useful to them. Mathematics was next with two responses, followed by audio sound, computer program, and microwave courses.

The data presented in Table XII identify the titles of courses or activities most useful for automotive respondents from each of the four ITVE campuses. The courses or activities identified by graduates from the Bangkok campus were student practice, business courses, and electricity. The least useful courses were general education and industrial pneumatics and hydraulics. The Chiang Mai campus graduates listed the

TABLE X

TITLES OF COURSES OR ACTIVITIES THAT ARE LEAST USEFUL FOR THEIR PRESENT JOB AS PERCEIVED BY AUTOMOTIVE GRADUATES FROM THE TWO UNITED STATES TECHNICAL INSTITUTES

Oklahoma State Tech.		Texas State Tech.	
Number of Responses	Title	Number of Responses	Title
5	General education	4	General education
2	Business principles	2	Basic engines
1	Machine shop	2	Mathematics
1	Auto transmissions	1	Manual transmissions
1	Physics	1	Chemistry
		1	Hand tools

TABLE XI

TITLES OF COURSES OR ACTIVITIES THAT ARE LEAST USEFUL FOR THEIR PRESENT JOB AS PERCEIVED BY ELECTRONICS GRADUATES FROM THE TWO UNITED STATES TECHNICAL INSTITUTES

Oklahoma State Tech.		Texas State Tech.	
Number of Responses	Title	Number of Responses	Title
6	General education	3	Communications
2	Electronic communications	2	Mathematics
1	Mathematics	1	Audio sound
1	Business principles	1	Computer program
1	Instrumentation	1	Microwave

TABLE XII

TITLES OF COURSES OR ACTIVITIES CONSIDERED MOST USEFUL FOR THEIR PRESENT JOB AS PERCEIVED BY AUTOMOTIVE GRADUATES FROM THE FOUR INSTITUTE OF TECHNOLOGY AND VOCATIONAL EDUCATION CAMPUSES IN THAILAND BY FREQUENCY OF RESPONSE

Courses or activities	Bangkok	Chiang Mai	Nakhorn Rajsima	Songkla
Student practice	47	45	28	26
Business course	45	46	27	25
All courses	44	43	26	25
Electricity	44	42	27	26
Diesel technology	43	40	20	20
Mechanics for technicians	42	39	22	20
Workshop III (tune-up)	42	42	25	23
Workshop IV (diesel & fuel injection)	42	40	22	21
Workshop V (air and refrigeration)	39	39	20	20
Workshop VI (general service)	39	40	22	21
Thermodynamics	35	37	20	20
Fluid power	32	33	20	21
Blueprint reading	30	32	21	20
Internal combustion I	29	30	19	18
Mechanical laboratory I	28	32	20	19
Mechanical laboratory II	26	28	17	17
Workshop II (brake and steering)	25	27	18	17
Workshop I (engine)	23	22	15	11
Steam technology	20	24	16	12
Industrial pneumatics	17	13	10	8
General education	13	14	7	7

most useful courses or activities as business, student practice, and all courses in the automotive program. The least useful courses were industrial pneumatics and hydraulics, and general education. Graduates from Nakhorn Rajsima campus listed student practice, business courses, electricity, and all courses had been most useful to them. The least useful courses were general education and industrial pneumatics and hydraulics. From the Songkla campus, courses identified as most useful were electricity, student practice, business courses, and all courses. Also, the least useful courses were general education and pneumatics and hydraulics.

The data presented in Table XIII identify the titles of courses or activities listed from the four ITVE campuses in Thailand. The courses identified as most useful by graduates from the Bangkok campus are, in order of importance: shop practice, on-the-job training, and computer programming. Those courses found useful by electronics graduates responses were general education, U.H.F. techniques, and telecommunication systems. At the Chiang Mai campus, the top three courses or activities found most useful by graduates were shop practice, computer programming, and on-the-job training. The least useful courses were U.H.F. techniques, electrical machines, materials and processes, telecommunication systems, and general education. At Nakhorn Rajsima campus, the most useful courses or activities in the order of importance were shop practice, on-the-job training, and computer programming. The Songkla campus graduates reported the same courses as Nakhorn Rajsima campus. The least useful courses from the Nakhorn Rajsima campus were telecommunication, modulation and transmission, general education, and material processes. Those found least useful at Songkla campus were U.H.F. techniques, general education, material and processes, and modulation

TABLE XIII

TITLES OF COURSES OF ACTIVITIES CONSIDERED MOST USEFUL FOR THEIR PRESENT JOB AS PERCEIVED BY ELECTRONICS GRADUATES FROM THE FOUR INSTITUTE OF TECHNOLOGY AND VOCATIONAL EDUCATION CAMPUSES IN THAILAND BY FREQUENCY OF RESPONSE

Courses or activities	Bangkok	Chiang Mai	Nakhorn Rajsima	Songkla
Shop practice	40	45	31	32
On-the-job training	38	39	30	31
Computer programming	38	40	29	29
All courses	37	38	28	28
Technical report writing	35	34	20	21
Business management	35	38	20	22
Power plant control	34	37	23	22
Electric circuit I	34	36	21	20
Electric circuit II	33	37	20	20
Digital techniques	33	36	18	19
Pulse and switching	31	33	17	18
Transmitter and receiver	29	30	17	15
Electronics devices	29	30	18	15
Industrial management	28	27	11	12
Industrial elect. design	27	28	12	11
Electronics training aid development	26	26	14	12
Television system	24	24	13	12
Modulation and transmission	22	23	9	9
Material and processes	20	18	10	9
Electrical machine	19	19	10	8
Telecommunication system	15	17	7	8
U.H.F. techniques	15	19	12	10
General education	13	17	10	9

and transmission.

The data presented in Table XIV identifies the post graduate enrollment in formal course studies by automotive technology graduates. The table shows that the total number of automotive respondents in the United States was 56. Of this number, 26 (46.4%) had enrolled in formal courses while 30 (53.6%) had not enrolled in any courses. The total number of Thai graduates in in automotive who responded was 295. Of this number, 118 (40.0%) had enrolled in formal courses while 177 (60.0%) had not enrolled in any courses.

The data presented in Table XV identifies the post graduate enrollment in formal course studies by electronics technology majors. The table reveals that the total of electronics respondents in the United States was 66. Of this number, 31 (47.)%) had enrolled in formal courses while 35 (53.0%) had not enrolled in any courses. The total number of Thai graduates in electronics who responded was 254. Of this number, 98 (38.6%) had enrolled in formal courses while 156 (61.4%) had not enrolled in any courses.

The data presented in Table XVI are related to the type of courses graduates in automotive technology majors have enrolled in since graduation. The table reveals that 22 (84.6%) automotive respondents out of 26 of the United States graduates indicated that they had enrolled in non-credit (in-house industrial or business courses) since graduation. Four (15.4%) had enrolled in college to get a degree. The total number of automotive respondents in Thailand was 118. Of this number, 40 (33.9%) indicated that they had enrolled in non-credit courses since graduation. Thirty-three (28.0%) had enrolled in college courses to get a degree. Thirty-six (30.5%) had military training and nine (7.9%) had

TABLE XIV

POST GRADUATE ENROLLMENT IN FORMAL COURSE STUDIES
BY AUTOMOTIVE TECHNOLOGY MAJORS

	United States		Thailand	
Enrollment	N	%	N	%
Yes	26	46.4	118	40.0
No	30	53.6	177	60.0

TABLE XV

POST GRADUATE ENROLLMENT IN FORMAL COURSE STUDIES
BY ELECTRONICS TECHNOLOGY MAJORS

	United States		Thailand	
Enrollment	N	%	N	%
Yes	31	47.0	98	38.6
No	35	53.0	156	61.4

TABLE XVI

POST GRADUATE FORMAL COURSE ENROLLMENT OF AUTOMOTIVE TECHNOLOGY BY TYPE OF COURSE

	United States		Thailand	
Type of course	N	%	N	%
Non-credit (in-house industrial or business)	22	84.6	40	33.9
College credit courses to get a degree	4	15.4	33	28.0
Military training	0	0	36	30.5
Training abroad	0	0	9	7.6

received training abroad.

The data presented in Table XVII identify the type of courses which electronics respondents had enrolled in since graduation. The table reveals that 18 (58.1%) of the 31 respondents in the United States indicated that they had enrolled in non-credit courses. Thirteen (41.9%) indicated that they had enrolled in college to get a degree. The total number of electronics graduates who responded was 98. Of this number, 41 (41.8%) indicated that they had enrolled in non-credit courses. An additional 29 (29.6%) graduates enrolled in college credit courses to get a degree. Twenty (20.4%) had military training while 8 (8.2%) had received training abroad.

The data presented in Table XVIII identifies the type of courses or programs respondents were interested in pursuing. The table reveals that 28 (50.0%) graduates of the 56 automotive respondents in the United States were interested in pursuing additional automotive technology courses. Fourteen (25.0%) were interested in business management, followed four (7.1%) who were interested in pursuing a bachelor degree. Ten (17.9%) graduates were undecided. The total number of automotive respondents in Thailand was 315. Of this number, 122 (38.7%) were interested in pursuing additional automotive technology courses, while 98 (31.1%) were interested in business management. An additional 50 (15.9%) graduates were interested in pursuing a bachelors degree. The remaining 45 (14.3%) graduates were undecided.

The data presented in Table XIX identify the type of courses or programs electronics technology respondents were interested in pursuing. The table reveals that 30 (45.5%) out of the 66 electronics responded in the United States were interested in additional electronic technology

TABLE XVII

POST GRADUATES FORMAL COURSE ENROLLMENT OF ELECTRONICS TECHNOLOGY PROGRAM BY TYPE OF COURSE

	United States		Thailand	
Type of course	N	%	N	%
Non-credit (in-house industrial or business)	18	58.1	41	41.8
College credit courses to get a degree	13	41.9	29	29.6
Military training	0	0	20	20.4
Training abroad	0	0	8	8.2

TABLE XVIII

POST GRADUATES STUDIES PREFERRED BY AUTOMOTIVE TECHNOLOGY GRADUATES

	United States		Thailand	
Type of Course or Program	N	%	N	%
Automotive technology	28	50.0	122	38.7
Business management	14	25.0	98	31.1
Leading to a B.S. degree	4	7.1	50	15.9
Undecided	10	17.9	45	14.3

TABLE XIX

POST GRADUATE STUDIES PREFERRED BY ELECTRONICS TECHNOLOGY GRADUATES

	United States		Thailand	
Type of Course or Program	N	%	N	%
Electronics technology	30	45.5	101	36.9
Business management	13	19.7	73	26.6
Leading to a B.S. degree	9	13.7	59	21.5
Undecided	8	12.1	41	15.0

courses. Thirteen (19.7%) graduates were interested in business management programs while nine (13.7%) were interested in pursuing courses leading to a bachelors degree. An additional eight individuals (12.1%) were undecided. The total number of the electronics respondents in Thailand was 274. Of this number, 101 (36.9%) were interested in additional electronic technology courses while 73 (26.6%) were interested in pursuing courses leading to a bachelors degree. An additional 41 (15.0%) graduates were undecided.

The data presented in Table XX reveals major reasons why respondents perceived themselves as pursuing additional courses or programs. Data reveal that of the 56 automotive respondents from the two technical institutes in the United States, more than 50 percent indicated that their major reasons in pursuing additional courses would be for advancement in their present jobs and to improve their general knowledge or education. A third reason given by approximately one-third of respondents was to earn credit toward a degree. Even fewer respondents (one-fourth), indicated that their major reasons for pursuing additional study was to prepare for a different occupation; only four of the automotive graduates indicated other reasons. For the 66 electronics technology respondents graduates in the United States, a similar pattern of responses was revealed. For the 315 automotive respondents graduates in Thailand, more than 50 percent indicated that their major reasons in pursuing additional courses would be for advancement in their present jobs and to improve their general knowledge or education. A third reason given by 87 of the respondents was to get credit toward a degree. Sixty-four respondents indicated that they intended to prepare for a

TABLE XX

RESPONSES AS TO MAJOR REASONS FOR PURSUING ADDITIONAL STUDY AS EXPRESSED BY GRADUATES

Technical Institute	Automotive Technology					Electronics Technology				
	To advance in job field	To prepare for diff. occupation	To improve general knowledge	To get credit toward a degree	Others	To advance in job field	To prepare for diff. occupation	To improve general knowledge	To get credit toward a degree	Others
Okla. State Tech., Okmulgee	15	5	17	7	3	14	5	13	11	4
Texas STate Tech. Inst., Waco	18	5	16	5	1	21	9	25	13	4
ITVE* Bangkok Campus	79	19	75	21	10	59	16	49	25	12
ITVE Chiang Mai Campus	75	17	78	24	17	61	17	52	23	16
ITVE Nakhorn Rajsima Campus	58	15	57	22	11	46	13	39	21	15
ITVE Songkla Campus	45	13	47	20	15	48	14	41	21	11

*Institute of Technology and Vocational Education

different occupation. Fifty-three of the respondents indicated other reasons. For the 274 electronics technology respondents graduating in Thailand, a similar pattern of responses was revealed.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The responsibility of technician educators does not end when students graduate. It is important that the educators follow-up on their graduates. The importance of the occupational follow-up was succinctly expressed in a quotation from the report of the Advisory Council on Vocational Education (1968). Little (1970) stated:

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

Summary

The purpose of this study was to develop and evaluate a model for conducting a follow-up study of technician program graduates. This study included graduates of two technical institutes in the United States and four campuses of the Institute of Technology and Vocational Education (ITVE) in Thailand during the five-year period from 1976 through 1980.

The information needed for the study was obtained through the use of a mailed, self-administered questionnaire. The questionnaire was developed in such a manner as to elicit short answer, check mark, and open-ended type responses. Six technical institutes were included in this study. They were: 1) Oklahoma State University School of Technical

Training at Okmulgee, 2) Texas State Technical Institute at Waco, 3) ITVE, Bangkok Campus, 4) ITVE, Chiang Mai Campus, 5) ITVE, Nakhorn Rajsima Campus, and 6) ITVE, Songkla Campus.

Findings and Conclusions

Given below is a summary of the findings presented in Chapter IV and the subsequent conclusions drawn particularly as related to these findings. Findings largely came from responses to the questionnnaire which was developed to relate directly to each of the objectives set forth in this study.

The first objective of the study was to determine to what extent the graduates are employed in the fields in which they received an Associate degree or the equivalent. Ninety-five percent of the respondents in the automotive and electronics fields studied in the two technical institutes in the United Sates were found to be holding jobs in or related to their fields of major study. This figure of 95.0 percent for graduates in the United States can be compared to that for automotive and electronics graduates in Thailand where 83.7 percent of the respondents from the four campuses of the Institute of Technology and Vocational Education indicated that they presently hold jobs in or closely related to the fields in which they were trained. A high percentage (95%, and 83.7%) of both United States and Thailand graduates are employed in the fields in which they received their training.

The second objective of the study was to determine starting and present salary levels of graduates from both automotive and electronics technology. The average starting annual salary of graduates from the two technical institutes in the United States in automotive technology

was $13,259.26 compared with $15,230.77 for electronics technology graduates. The average present annual salary of automotive technology graduates of the two technical institutes in the United States was $16,678.57 and $18,584.67 for electronics technology graduates. The average starting annual salary at each of the four ITVE campuses in Thailand in automotive technology was as follows: the Bangkok campus was $1,467.00 (33,741.00 Baht), the Chiang Mai campus was $1,506.96 (34,660.08 Baht), the Nakhorn Rajsima campus was $1,550.04 (35,650.92 Baht), and the Songkla campus was $1,585.68 (36,470.64 Baht). The average starting annual salary of the ITVE electronics technology graduates was as follows: the Bangkok campus was $1,448.40 (33,313.20 Baht), the Chiang Mai campus was $1,417.80 (32,609.40 Baht), the Nakhorn Rajsima campus was $1,533.60 (35,272.80 Baht), and the Songkla campus was $1,500.00 (34,500.00 Baht). The average present annual salary for automotive technology graduates at each of the four ITVE campuses was as follows: $2,607.72 (59,977.56 Baht); $2,672.04 (60,587.52 Baht); $2,550.00 (58,650.00 Baht); and $2,565.36 (59,003.28 Baht). The average present annual salary of ITVE electronics technology graduates was as follows: $2,691.48 (61,904.04 Baht); $2,634.24 (60,587.52 Baht); $2,586.84 (59,497.32 Baht); and $2,552.88 (58,716.24 Baht). Salaries for automotive technology graduates in the United States were lower than electronics technology graduates. In Thailand the starting annual salaries of the automotive technology graduates at all of the ITVE four campuses were higher than for the electronics technology graduates. However, the present annual salaries of electronics technology graduates at all of the four ITVE campuses were higher than the automotive technology graduates.

The third objective of the study was to determine the frequency of change from entry level to the present job within or outside the major fields of study. Of the total number of automotive respondents from OST, 28.6% had held only one job while 67.9% of TSTI automotive respondents had held only one job. In like manner, it was determined that 53.8% of OST and 64.7% of TSTI electronics respondents had held only one job since graduation. Of the total number of the respondents in automotive technology from the four ITVE campuses in Thailand, 244 (84.7%) of automotive respondents and 250 (82.8%) of electronics technology respondents had held only one job since graduation. It was concluded that most of respondents from each of the automotive and electronics fields of study in Thailand tended to continue working at the first job. In the United States, most of OST automotive graduates held more than one job. However, the majority of TSTI graduates had held only one job. The majority of United States electronics technology graduates had also held only one job. OST automotive graduates were the only group that tended to change jobs. The majority of other graduates tended to remain with one particular job.

The fourth objective of the study was to determine the graduates' need for additional formal education as perceived by the graduates. Fifty percent of the automotive respondents in the United States indicated that they needed additional automotive technology courses while 38.7% of the automotive respondents in Thailand indicated that they needed additional education in automotive technology courses. Twenty-five percent of the respondents from automotive technology programs employed in the United States and 31.1% of their counterparts in Thailand felt that they could profit from an additional courses in

business management. In like manner, 45% of the electronics graduates in Thailand indicated a desire to have additional education in electronics technology courses. When additional training in business management was suggested, 19.7% of the electronics technology respondents in the United States and 26.6% of the electronics technology graduates respondents in Thailand felt that they could profit from this additional training. Most of the graduates from the two technical institutes in the United States and the four ITVE campuses in Thailand specifically recommended courses in their major fields. The most frequently mentioned course outside of their degree area by both the United States and Thailand graduates was business management.

The fifth objective of the study was to state where the curriculum could be improved as perceived by the graduates. Of the 122 total respondents in the United States, 57 (46.7%) responded to the open-ended question and of the 589 total respondents in Thailand, 275 (46.7%) responded to the open-ended question. Graduates were asked for suggestions to improve technical programs based upon their educational and work experiences. It was found that most of the United States and Thailand graduates tended to indicate that on-the-job training and business courses along with more laboratory exercises would improve their programs.

Recommendations

On the basis of the information obtained in this study, the following recommendations are suggested as related to: 1) program and curriculum, 2) follow-up questionnaire, and 3) suggested follow-up model.

Program and Curriculum

1. It is recommended that increased numbers of field trips to business and industry be conducted.

2. On-the-job training experiences should be included in the curriculum.

3. Emphasizing student development of courses and programs which better prepare graduates for employment.

4. Technical departments should keep in contact with automotive and electronics graduates to determine what skill area should receive emphasis in future automotive and electronics technology programs.

5. Thai instructors should have some experiences in industry, or have an opportunity to observe and practice in industry.

6. There seems to be little communication between technical institutes and industry both in the United States and Thailand. It is recommended that administrators give careful consideration to providing departmental representatives with sufficient time to visit employers.

7. Institutes should offer extension courses and correspondence courses to the public.

8. It is recommended that institutes in both countries publish a monthly or an annual newsletter to introduce new technology techniques to the former students.

Follow-up Questionnaire

Since a part of the intent of this study was to develop a follow-up questionnaire model, specific suggestions to improve the follow-up

questionnaire used in this study are as follows:

1. Question #4 should say "Address of someone who will always know where you are", because there is some evidence the respondents felt that their present address was their permanent address. The permanent address should be eliminated from the questionnaire.

2. Question #13 should be revised to include a series of courses require respondents to check a course instead of writing the name of a course or program, since there is some evidence that graduates forget the name or titles of courses.

3. Comments for improving questionnaire items should appear on the survey instrument and not in the letter of transmittal.

4. A question "Do you feel that the program of study adequately prepared you for you first employment upon graduation?" should be included in the questionnaire.

5. In future follow-up studies, it is suggested that the questionnaire utilize a Yes or No and/or check mark, and/or multiple choice form to make it easier for the respondents to reply.

6. The wage per hour or monthly salary should be asked instead of the annual salary or monthly salary.

A Suggested Model for Conducting Follow-up Studies

Since the primary objective of this study was develop and test a model for conducting a follow-up study of technical graduates, it is recommended that individuals planning to conduct such a follow-up

consider the following outline:

I. Preparation:

1. Develop objectives for the follow-up study.
2. Identify population and sample of graduates to be included in the follow-up.
3. Choose the best all around method for conducting follow-up study, i. e., mailed questionnaire, personal interview, or telephone interviews.
4. Obtain addresses of former students.
5. Enlist the help of instructors or department heads to collect the completed questionnaire.
6. Establish mailing dates and prepare follow-up survey instrument for mailing.

II. Data Collection: Utilize a questionnaire like or similar to the one recommended in the following section.

1. First mailing -- questionnaire, cover letter, and stamped self-addressed return envelope.
2. Second mailing -- after a period of one to four weeks, follow-up letter with questionnaire, and stamped self-addressed return envelope to the ones who did not respond.
3. Conduct telephone survey for non-respondents to obtain the data by telephone or to encourage them to send in a completed questionnaire.

III. Data Analysis:

1. Identify how data will be compiled.
2. Define statistical techniques for data analysis.
3. Prepare follow-up report.

IV. Dissemination of Results

1. Identify groups to receive report such as administrators, instructors, minister of education, and government agencies.
2. Mail/present copies to identified groups.

Suggested Graduate Follow-up Questionnaire

GRADUATE QUESTIONNAIRE

1. Name _____
   First Middle Last
2. Present mailing address _____
   Number and Street
   _____
   City State Zip Code
3. Present telephone number _____
4. Address of someone who will always know where you are located.
   _____
   Number and Street
   _____
   City State Zip Code
5. Permanent telephone number _____
6. First vocational technical job after leaving the technical institute.
   First job title _____
   Name of first employer _____
   Address of first employer _____
   Number and Street
   _____
   City State Zip Code
   Telephone number of first employer _____
   Length of time on first job _____

7. Present job (if same as number 6 above, write same)

Job title _____

Employer's name _____

Employer's address _____
Number and Street

_____
City State Zip Code

Telephone number _____

Length of time with present employer _____

8. Do you feel that the program of study adequately prepared you for first employment upon graduation?

_____ Yes _____ No

9. Beginning annual salary (circle one)

$8,000-$9,999	$16,000-$17,999	$24,000-$25,999
$10,000-$11,999	$18,000-$19,999	Above $26,000
$12,000-$13,999	$20,000-$21,999	Please specify _____
$14,000-$15,999	$22,000-$23,999	

10. Present annual salary (circle one)

$10,000-$11,999	$18,000-$19,999	$26,000-$27,999
$12,000-$13,999	$20,000-$21,999	Above $28,000
$14,000-$15,999	$22,000-$23,999	Please specify _____
$16,000-$17,999	$24,000-$25,999	

11. What specific course(s) and/or activities in your program are the most useful to your present job?

_____

_____

_____

_____

12. What specific course(s) and/or activities in your program are the least useful in your present job?

_____

_____

_____

_____

13. Since graduation have you attended formal educational courses or programs?

_____ Yes _____ No

If yes, name courses or programs _____

_____

14. What type of courses or programs are you now interested in pursuing? Please check.

_____ Technical Speciality Courses

_____ Auxiliary and Supporting Courses

_____ Mathematics and Science Courses

_____ Communication Courses

_____ Social Science Courses

_____ Other course(s), please specify _____

_____ Other program(s), please specify _____

15. If you are intersted in pursuing additional courses or programs, what are your major reasons for being interested in these? (Please check as many as apply)

_____ To advance in my present job field

_____ To prepare for a different occupation

_____ To improve my general knowledge or education

_____ To get credit toward a degree

_____ Other (please specify) _____

16. Please give suggestions for improving our technical program and questionnaire based upon your educational and work experiences.

_____

_____

_____

_____

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APPENDIXES

APPENDIX A

DATA COLLECTION INSTRUMENT USED

IN THE UNITED STATES

GRADUATE QUESTIONNAIRE

1. Name _____
   First Middle Last

2. Present mailing address _____
   Number and Street

   _____
   City State Zip Code

3. Present telephone number _____

4. Address of someone who will always know where you are located.

   _____
   Number and Street

   _____
   City State Zip Code

5. Permanent telephone number _____

6. First vocational technical job after leaving the technical institute.

   First job title _____

   Name of first employer _____

   Address of first employer _____
   Number and Street

   _____
   City State Zip Code

   Telephone number of first employer _____

   Length of time on first job _____

7. Present job (if same as number 6 above, write same)

   Job title _____

   Employer's name _____

   Employer's address _____
   Number and Street

   _____
   City State Zip Code

   Telephone number _____

   Length of time with present employer _____

8. Do you feel that the program of study adequately prepared you for first employment upon graduation?

_____ Yes _____ No

9. Beginning annual salary (circle one)

$8,000-$9,999	$16,000-$17,999	$24,000-$25,999
$10,000-$11,999	$18,000-$19,999	Above $26,000
$12,000-$13,999	$20,000-$21,999	Please specify _____
$14,000-$15,999	$22,000-$23,999	

10. Present annual salary (circle one)

$10,000-$11,999	$18,000-$19,999	$26,000-$27,999
$12,000-$13,999	$20,000-$21,999	Above $28,000
$14,000-$15,999	$22,000-$23,999	Please specify _____
$16,000-$17,999	$24,000-$25,999	

11. What specific course(s) and/or activities in your program are the most useful to your present job?

_____

_____

_____

_____

12. What specific course(s) and/or activities in your program are the least useful in your present job?

_____

_____

_____

_____

13. Since graduation have you attended formal educational courses or programs?

_____ Yes _____ No

If yes, name courses or programs _____

_____

14. What type of courses or programs are you now interested in pursuing? Please check.

_____ Technical Speciality Courses

_____ Auxiliary and Supporting Courses

_____ Mathematics and Science Courses

_____ Communication Courses

_____ Social Science Courses

_____ Other course(s), please specify _____

_____ Other program(s), please specify _____

15. If you are intersted in pursuing additional courses or programs, what are your major reasons for being interested in these? (Please check as many as apply)

_____ To advance in my present job field

_____ To prepare for a different occupation

_____ To improve my general knowledge or education

_____ To get credit toward a degree

_____ Other (please specify) _____

16. Please give suggestions for improving our technical program and questionnaire based upon your educational and work experiences.

_____

_____

_____

_____

APPENDIX B

DATA COLLECTION INSTRUMENT TRANSLATED INTO THAI

แบบสอบถามผู้ที่สำเร็จการศึกษา

จากวิทยาลัยเทคโนโลยีและอาชีวศึกษา

๑. ชื่อและนามสกุล .....

๒. ที่อยู่ปัจจุบัน .....

๓. หมายเลขโทรศัพท์ .....

๔. ที่อยู่ถาวร (ซึ่งสามารถติดต่อได้ทุกโอกาส) .....

.....

๕. หมายเลขโทรศัพท์ .....

๖. ถ้าท่านได้เคยทำงานครั้งแรกหลังจากที่สำเร็จการศึกษาหรือไม่ กรุณากรอกข้อความดังต่อไปนี้

ชื่อหน่วยงาน .....

ตำแหน่ง .....

ที่อยู่ (ที่ทำงาน) .....

หมายเลขโทรศัพท์ .....

ทำงานเป็นเวลา ..... ปี ..... เดือน

๗. ปัจจุบันทำงานอยู่ ณ

ชื่อหน่วยงาน .....

ตำแหน่ง .....

ที่อยู่ (ที่ทำงาน) .....

หมายเลขโทรศัพท์ .....

ทำงานเป็นเวลา ..... ปี ..... เดือน จนถึงปัจจุบัน

๘. รายได้ต่อเดือน (ไม่รวมเงินล่วงเวลา) ของงานครั้งแรกที่ทำ

..... ระหว่าง ๕๐๐ บาท ถึง ๑,๕๐๐ บาท

..... ระหว่าง ๑,๕๐๐ บาท ถึง ๒,๕๐๐ บาท

..... ระหว่าง ๒,๕๐๐ บาท ถึง ๓,๕๐๐ บาท

..... ระหว่าง ๓,๕๐๐ บาท ถึง ๔,๕๐๐ บาท

..... ตั้งแต่ ๔,๕๐๐ บาทขึ้นไป

๙. รายได้ปัจจุบัน (ไม่รวมเงินล่วงเวลา)

..... ระหว่าง ๑,๕๐๐ บาท ถึง ๒,๔๐๐ บาท

..... ระหว่าง ๒,๔๐๐ บาท ถึง ๓,๔๐๐ บาท

..... ระหว่าง ๓,๔๐๐ บาท ถึง ๔,๔๐๐ บาท

..... ระหว่าง ๔,๔๐๐ บาท ถึง ๕,๔๐๐ บาท

..... ตั้งแต่ ๕,๔๐๐ บาทขึ้นไป

๑๐. โปรดระบุรายชื่อวิชาที่บรรจุอยู่ในหลักสูตรสาขาวิชาชีพที่ท่านเคยเรียนมาและเห็นว่ามีประโยชน์มากที่สุด ต่ออาชีพของท่านในปัจจุบัน

....

....

....

๑๑. โปรดระบุรายชื่อวิชาที่บรรจุอยู่ในหลักสูตรสาขาวิชาชีพที่ท่านเคยเรียนมาและเห็นว่าไม่มีประโยชน์ ต่ออาชีพของท่านในปัจจุบัน

....

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๑๒. หลังจากที่ท่านสำเร็จการศึกษาแล้ว ท่านเคยไปศึกษาอบรมหรือดูงานเพิ่มเติมอีกบ้างไหม?

☐ เคย ☐ ไม่เคย

ถ้าเคยโปรดระบุด้วย .....

๑๓. ถ้าท่านสนใจที่จะศึกษาอบรมหรือดูงานเพิ่มเติมในสาขาวิชาชีพโปรดกรุณาระบุด้วยว่าท่านสนใจสาขาวิชาใดบ้าง

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๑๘. ท่านมีจุดประสงค์หรือความสนใจเป็นพิเศษอย่างไรเกี่ยวกับการฝึกอบรมดูงานหรือศึกษาเพิ่มเติม (กรุณาเลือกคำตอบดังต่อไปนี้)

..... เพื่อต้องการให้งานที่ท่านทำอยู่ในปัจจุบันก้าวหน้ายิ่งขึ้น

..... เพื่อเตรียมตัวในการที่จะเปลี่ยนงานใหม่

..... เพื่อปรับปรุงความรู้ความสามารถทางด้านวิชาการให้ดียิ่งขึ้น

..... เพื่อต้องการที่จะได้ปริญญาบัตร

..... อื่น ๆ (ถ้ามี) .....

๑๙. จากประสบการณ์ในการทำงานของท่าน ท่านมีข้อเสนอแนะอย่างไรในการที่จะปรับปรุงหลักสูตรสาขาวิชาชีพและผลที่ท่านจบมา ให้มีประสิทธิภาพดียิ่งขึ้นต่อไป

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APPENDIX C

OST TRANSMITTAL LETTER

December 5, 1982

Dear OST Graduate:

We at Oklahoma State University School of Technical Training in Okmulgee would like to invite you to participate in a graduate follow-up study. Your input into the study will help us to make our programs better and will help us improve the questionnaire. The enclosed questionnaire is designed to help you reflect upon your educational and work experiences.

It is our hope that you will take a few minutes to complete the short form which is enclosed. We have also enclosed a self-addressed, stamped envelope to return the form.

We will sincerely appreciate the quick return of the form, and we thank you in advance for your cooperation.

Sincerely,

Ms. Ganitha Kampanrana
Research Associate

APPENDIX D

TRANSMITTAL LETTER TO TSTI AUTOMOTIVE GRADUATES

Oklahoma State University

SCHOOL OF OCCUPATIONAL AND ADULT EDUCATION

STILLWATER, OKLAHOMA 74078
CLASSROOM BUILDING 406
(405) 624-6275

December 5, 1982

Dear TSTI Graduate:

We need your help! We at Oklahoma State University are involved in an international study of high level technical institute graduates and we are pleased to state that the Automotive Mechanics graduates from TSTI have been selected to participate in the study. The information you can provide us will be very helpful in the design of a follow-up questionnaire and the further improvement of technical programs in the United States and abroad.

Would you please take just a few minutes to complete and return a questionnaire in the enclosed self-addressed stamped envelope.

We will sincerely appreciate the quick return, and we thank you in advance for your cooperation.

Sincerely,

Ms. Ganitha Kampanrana
Research Associate

APPENDIX E

TRANSMITTAL LETTER TO TSTI ELECTRONICS GRADUATES

Oklahoma State University

SCHOOL OF OCCUPATIONAL AND ADULT EDUCATION

STILLWATER, OKLAHOMA 74078
CLASSROOM BUILDING 406
(405) 624-6275

December 5, 1982

Dear TSTI Graduate:

We need your help! We at Oklahoma State University are involved in an international study of high level technical institute graduates and we are pleased to state that the Electronic Technology graduates from TSTI have been selected to participate in the study. The information you can provide us will be very helpful in the design of a follow-up questionnaire and the further improvement of technical programs in the United States and abroad.

Would you please take just a few minutes to complete and return a questionnaire in the enclosed self-addressed stamped envelope.

We will sincerely appreciate the quick return, and we thank you in advance for your cooperation.

Sincerely,

Ms. Ganitha Kampanrana
Research Associate

APPENDIX F

FOLLOW-UP LETTER USED IN UNITED STATES

January 3 , 1983

Dear Sir:

We recently sent you a letter inviting you to participate in our graduate follow-up study. The information which we are seeking is badly needed by the institution.

If you have not already done so, will you please take just a few minutes to complete the questionnaire and return it in the self-addressed, stamped envelope.

Your cooperation in helping to make this study a success is appreciated.

Sincerely,

Ms. Ganitha Kampanrana
Research Associate

APPENDIX G

TRANSMITTAL LETTER USED IN THAILAND

วิทยาลัยเทคโนโลยีและอาชีวศึกษา
ถนนสามเสน กรุงเทพฯ ๑๐๓๐๐

๑ มิถุนายน ๒๕๒๔

เรียน ศิษย์เก่าวิทยาลัยเทคโนโลยีและอาชีวศึกษา ทุกท่าน

แบบสอบถามนี้ เป็นเอกสารที่ต้องการสำรวจและรวบรวมข้อมูลทางการศึกษาของท่าน หลังจากที่จบการศึกษาไปแล้ว วัตถุประสงค์แบบสอบถามนี้คือ

๑. เพื่อสำรวจความคิดเห็นเกี่ยวกับสาขาวิชาชีพที่ท่านเรียนมา ในแต่ละสาขาวิชาชีพ ซึ่งจะนำข้อมูลที่ได้จากท่านนี้ นำไปปรับปรุงหลักสูตรสาขาวิชาชีพให้มีประสิทธิภาพ ตามความต้องการของสังคมและให้ทันสมัยยิ่งขึ้น

๒. เพื่อที่จะได้นำเป็นมาตรฐานของการสำรวจนักศึกษา ภายหลังจากที่จบการศึกษาไปแล้ว ของแต่ละแผนกหรือวิทยาลัยในอันดับต่อไป

๓. เพื่อเป็นข้อมูลในการประกอบการศึกษา ซึ่งจะช่วยให้การเขียนวิทยานิพนธ์ในระดับปริญญาเอก ของผู้สำรวจประสบผลสำเร็จตามเป้าหมาย

จึงขอความกรุณามายังท่านซึ่งเป็นศิษย์เก่า โปรดได้ให้ความร่วมมือ โดยการกรอกข้อมูลนี้ด้วย จักขอบพระคุณยิ่ง

ขอขอบพระคุณมา ณ ที่นี้ด้วย

APPENDIX H

FOLLOW-UP LETTER USED IN THAILAND

วิทยาลัยเทคโนโลยีและอาชีวศึกษา

ถนนสามเสน กรุงเทพ ๑๐๓๐๐

๑ สิงหาคม ๒๕๒๔

เรียน ศิษย์เก่าวิทยาลัยเทคโนโลยีและอาชีวศึกษา

ด้วยดิฉันได้ส่งจดหมายเชิญท่านร่วมมือในการตอบคำถามของนักศึกษาที่สำเร็จการศึกษา**ไป**แล้วนั้น ถ้าหากว่าท่านยังไม่ได้กรอกข้อความในคำถามที่ดิฉันส่งไปแล้วครั้งหนึ่ง โปรดกรุณาสละเวลาของท่านสักเล็กน้อยแล้วส่งกลับคืนมายังที่อยู่ที่แนบมาด้วยจักขอบพระคุณในความช่วยเหลือของท่านเป็นอย่างยิ่ง

ขอขอบพระคุณมา ณ ที่นี้ด้วย

APPENDIX I

JOB TITLES OF AUTOMOTIVE GRADUATES IN U.S.

Job Title

Apprentice Mechanic

Assistant Manager

Automotive Mechanic

Aviation Structural Mechanic

Coachman

C.N.C. Lathe Mechanist

Contract Treating Truck, Driver

Cost Accountant

Department Secretary

Diesel Mechanic

Field Service Repair

General Line Mechanic

Field Service Repair

General Line Mechanic

Instructor

Industrial Mechanic

Laborer

Lab Technician

Line Mechanic

Laborer

Lab Technician

Line Mechanic

Make Ready Mechanic

Manufacturing Engineer

Mechanic

Mechanic (Owner)

Mechanic Power Supply

N.C. Programmer

New Car Mechanic

Parts Manager

Service Advisor

Shop Foreman

Stationary Engineer

Technician

Used Car Mechanic

APPENDIX J

JOB TITLES OF ELECTRONICS GRADUATES IN U.S.

Job Title

Advance Customer Engineer

Applied Automotion-Subsidiary

Apprentice Electrical

Assistant Technician

Associate Instrument Technician

Carpenter and Electrician

Comm. Technician

Computer Technician

Contract Technician

Control Technician

Customer Service

Customer Service Repair

Electrician

Electronic Technician

Electronic Tee (M.C.I.)

Electrical Inspector

Electrical Installation

Engineer Assistant

Engineering Technician

Equipment Maintenance Specialist

Field Service Customer Engineer

Field Supervisor

Heating and Air-conditioning Serviceman

Instrument Manager

Instrument Engineer

Instructor

Instrumentation Technician

Job Runner

Junior Observer

Junior Telephone Engineer

Maintenance Foreman

Maintenance Engineer

Operator

Part Analyze

Process Computer Technician

Production Technician

Quality Assurance Inspector

Relay Technician

Refrigeration Technician

Service Repair

Service Representative

Service Technician

Senior Manufacturing Methods Technician

System Technician

Technician

Technician Repair

Telecommunication Technician

Test Technician

Xerox Technician Repair

APPENDIX K

JOB TITLES OF AUTOMOTIVE GRADUATES IN THAILAND

In those instances where a particular job title was given more than once, the frequency of occurrence has been listed in parentheses after that title.

Acting head, water pumping equipment Division

Assistant Instructor

Assistant Supervisor

Assistant Technician

Automobile Seller

Automotive Tire Service Man

Boiler Controller

Bus Station Manager

Bus ticket Seller

Captain, Royal Thai Air Force, Pilot Instructor

Captain, Royal Thai Army, Pilot

Captain Royal Thai Army

Clerk, Credit Office

Control Technician

Division Head, Accelerating Rural Department

Division Head, Technical School Instructor

Division Head, Vocational School Instructor

Division Head, Hospital Mechanics

Division Head, Machine and Welding Shop

Farmer

Foreman, Automotive Industry

Foreman, Battery Division

Foreman, Car body Division

Foreman, Land Transportation Department

Foreman, Mechanical Equipment Repair

Foreman, Sugar Cane Plant

Foreman, Tire Industry

Foreman, Vegetable Canning Plant

Foreman, Siam Khonlakarl Company

Head, Automotive Service Division

Head, Automotive Service Station

Head, Royal Irrigation Division, Provincial Mechanics

Head, Motor Cycle Mechanics

Head, Tractor Service Division

Head, Vehicle Service Division

Inspector

Inspector Assistant; Assembly Line

Inspector, Tire Company

Instructor, Technical Institute

Instructor, Poly-Technical School

Instructor, Vocational Technical School

Instructor, Automotive Shop

Instructor I

Junior Engineer

Lieutenant, Royal Thai Army

Lieutenant, Royal Thai Army, Pilot

Lieutenant, Royal Thai Air Force

Manager

Manager, Construction

Manager, Personal

Manager, Repair and Maintenance

Manager, Car Dealer

Maintenance and Control Technician

Mechanics Automotive Shop

Mechanics, Agricultural Research Center

Mechanics, Forestry

Mechanics, Hospital

Mechanics, Provincial Public Health Center

Mechanics, Motor Cycle Department

Mechanics, Royal Irrigation Department

Mechanics, Royal Thai Highway Department

Mechanics, Royal Thai Railway

Mechanics, Heavy Equipment

Mechanical Technician

Mechanical Engineering

Mechanic I

Mechanic II

Mechanic III

Mechanic IV

Mechanics, Water Supply Station

Mechanical Buyer

Officer, Royal Thai Air Force

Officer, Royal Thai Army

Officer, Police

Operator

Owner, Used Car

Owner, Tire Store

Owner, Automotive Servicing

Owner, Building Material Store

Owner, Fuel and Oil Store

Plant Mechanic

Provincial Mechanic

Saleman

Saleman, Oil and Additive Agent

Seller, Grocery

Service man, New car Service

Store Keeper, Technical Institute

Store Keeper, Water Pumping Station

Self Employed

Supervisor

Supervisor and Demonstrator

Teacher, Primary School

Teacher, Secondary School

Teacher, Combustion Engine

Teacher II

Technician, Industrial Service Department

Technician, Quality Control

Technician, Water Management

Technician, Vehicle Management

Technician, Oil and Additive Office

Technician, Tractor Management

Used Car Seller

Used Car Exchanger

Water Piping Man

APPENDIX L

JOB TITLES OF ELECTRONICS GRADUATES IN THAILAND

Accountant

Airconditioning

Assistant Instructor

Assistant Supervisor Assistant Technician

Associate Instrument Technician

Audio-Visual Division Control

Bank Teller

Business Supply

Chief Foreman

Construction

Control Technician

Computer Service

Division Head, Technical School Instructor

Division Head, Vocational School Instructor

Division Head, Hospital Electronic

Electrician I

Electrician II

Electrician III

Electrician IV

Electronic Technician

Electrical Inspector

Electrical Installation

Electrical Maintenance

Engineer Technician

Equipment Maintenance

Field Supervisor

First Lieutenant, Royal Thai Army

First Lieutenant, Policeman

Foreman, Electricity Generating Autority

Foreman, Food Production

Foreman, General Electric

Foreman, National Electric

Foreman, Lampang Province Electric

Foreman, Chiang Mai Province Electric

Foreman, Chiang Rai Province Electric

Foreman, Songkla Province Electric

Foreman, Yala Province Electric

Foreman, Hard Yai Province Electric

Foreman, Khon Kan Province Electric

Foreman, Nakhorn Rajsrima Province Electric

Foreman, Udorn Province Electric

General Line Supervisor

Head Industrial Engineer

Inspector

Instrumentation Technician

Lieutanant, Royal Thai Army

Lieutanant, Royal Thai Air Force

Maintenance

Maintanance Control

Maintannance Foreman

Manager

Manager Provincial Electricity Autority

Manager Electric Supply

Officer

Operator

Owner Company

Personal Manager

Production Technician

Quality Assurance Inspector

Quality Control Engineering

Radio Shop Service

Radio Shop Repair

Refrigeration Teachician

Service Repair

Service Technician

Shop Instructor

Self Employed

Supervisor

Teacher High School

Technician

Television Store Repair

Telecommunication Technician

Telecommunication Officer

APPENDIX M

SELECTED COMMENTS FROM GRADUATES

"Teachers need to catch up on new ideas from people in the business and teach them to the students. Times and methods are changing."

"Increased time should be spent in automotive machinist, tune-up, and more emphasis placed on passenger car diesel engines (Ford and GM)."

"Students should practice the design and use of fixtures for high production parts, workshop area."

"More in shop training is recommended."

"I found that an associate degree does not help in advancements."

"More work on front wheel drive vehicles, overhead car engines, strut suspensions, and computerized ignitions should be stressed."

"Since the Ford Diesel has come out, the auto mechanic should study the diesel engine."

"More detail in inventory control and basic knowledge about cars and trucks and the way they work with a higher emphasis on Math and English, not just the basics."

"Keep up the high standards that make up OST students and keep them informed on all the late changes being made in the industry today."

"OST was very educational and helpful to me. I do not know what changes would be best, if any."

"Expand programming and machine tools to meet the standards of industry today. It would be expensive but to offset this expense the school could consider running the shop as a business, taking on some of the easier parts that companies are sending to outside venders to do. This in turn, would let students sample the work environment of

'being on the job'. It would mean that the school would have to inspect each part before returning it 'finished' to the company, but students would also be experienced in inspection."

"Expansion in 'all' types of cars not just domestic models is needed."

"The quality of the students turned out by any program reflects the overall quality of the teacher staff itself."

"Suggesting co-op or on-the-job training before or in between courses would be valuable to students."

"The school should offer correspondence courses through the mail."

"Give individual attention to students."

"Give students the idea that they have to work to succeed."

"Students need the knowledge of how to work with all kind of engines."

"The main courses such as tune-up, electrical and carburetion should be longer and more in depth."

"More courses in computer cars should be offered."

"Improve digital classes and go more in depth. The instrumentation classes needed upgrading badly when I was there. Equipment was far outdated and Lab work was insufficient."

"OST gave me my basic electronic training and showed Honeywell that I was trainable. I feel that attendance checked every day showed Honeywell that I was dependable. The Electronics Department should stay with what they had."

"Electronics is a very fast changing field, but transistor theory is behind. More advanced IC chips should be a course and new and advanced test equipment is a must. The courses I attended in 1978-79 taught me a good basic understanding of electronics."

"I learned after graduation that there is no substitute for experience."

"My education program from OST gave me a very good overall program. It touched on many essential skills and covered them very well in the length of time allowed. I feel the only way to improve the program would be to lengthen it. However, it prepared me for my present job very well."

"OST has a good program in electronics technology training. I learned a lot from the classes and working experiences."

"In these days and times in the electrical field, if a person learns as much as possible about controls and motor works, he is better off. I believe if I had it to do over again, I'd prefer the complete courses of study to be 2 years: 1 trimester of fundamentals, 2 trimesters of motor and controls, 1 trimester of residential wiring and 1 trimester of commercial and industrial wiring."

"For heating and airconditioning students, some knowledge of sheetmetal layout and fabrication would be most helpful."

"Computers (micro's) basic language needs more machine language."

"There is a need to improve the training on Board repair for computers or something similar."

"Make the courses harder."

"I would suggest, with every technical degreee, a short course of business management."

"There is a need to cover more of the codes and different types of pipe bending. A cable splicing class for all maintenance graduates would be helpful."

"Make the course more in line with other college courses, so they may be used as credit at other universities."

"More emphasis should be placed on practical application of the material taught from the text books."

"The most rewarding experience was that more than half of the total hours obtained at TSTI were in laboratory and hands on experience, which I believe is very important."

"I feel that teachers would be better if they were paid higher salary."

"ELT was very useful for the computer business that I am in. Using an oscilloscope more in class would help as would more laboratory time for hands-on eperience."

"Prepare your students for employment and also prepare them for future academic goals as best you can."

"Give opportunities to gain experience rather than theories."

"The ELT after school education leads persons in direction of management or engineering."

"Make sure the teachers want to teach and have patience with the students. Have as much laboratory work as possible for 'hands on' time with equipment and electronics, and an excellent basic electronics course to start the program."

"I would stress the importance of the labs to better understand what was taught in the classroom."

"TSTI should include more software courses."

"The program needs to provide in-depth knowledge and experience in microprocessors and their programming."

"Career futures are limited by a lack of a formal four year education, thus, the school needs to offer a B.S. degree in technology similar to the program at the University of Houston. Most credits from TSTI do not transfer at major colleges that do not offer technology programs."

"An Associate degree is worth only 5 years of career advancement in any high technology industry, at which time, additional education is required."

"The program needs to add semi-conductor theory and device physics to curriculum."

"Make a technology degree more competitive with engineering and science degrees."

"More extensive digital courses and some computer instrumentation courses would be valuable."

"Include as much laboratory time as possible to gain valuable 'hands on' experience. 'Don't tell me about electronics - show me'."

"We have good instructors."

"More programs toward working on large computers are needed."

"Include more hands on labs, and system and component level and trouble-shooting classes."

"Review literature and instructors more thoroughly, then direct these reviews to best benefit curriculum."

"More on-the-job training, more trouble shooting experience, including classes on estimation (bidding) of jobs is important. Class instruction of tools or other instruments needed to make the job easier would be helpful."

"We need more workshops and on-the-job training."

"I would like to suggest putting on-the-job training into the curriculum for one semester to prepare the student for the labor market before graduation."

"There is a need to improve the quality control courses because of the demands of industry in this time."

"Technology should be introduced to the student to support some ideas of student crativity and could be applied to the world of work."

"Need more training for the students who want to get a job immediately and more theory for the ones who want to continue a higher education."

"Teach the students how to be responsible to their employers."

"We have a good curriculum already, but we need more field trips."

"We need more theory, laboratory for airconditioning courses."

"The school needs more instruments to practice within the workshop."

"Develop human relations and morality of students."

"Improve and offer more courses of technical English."

"Limit the amount of students for better quality technician."

"Concentrate more on the workshop rather than theory."

"I would like to suggest more drafting design courses."

"Improve technical courses and related courses."

"It is very important to have on-the-job training 2 and 3 months before graduation, because the students will get more experience and also learn how to work with people."

"My knowledge in applied human relations have been the most useful to me in my present job."

"My training from school supplied me with the basics to begin my training in industry. I received more detailed training from the senior employees at my first job."

"I believe people try to get an advance degree, but what they need is more practical experience than what they learned in the class."

"On-the-job training in the major field of study is a big plus to all graduates."

"The courses I took to complete my degree have been very helpful. However, I feel that the requirements should include some basic management courses."

"More coursework should be devoted to practical application to industrial situations."

"We need counseling at graduation. It would help students to find the right first job."

"We would like to study advance electronics because technology is always involved with electronics."

"I suggest that more technical English be included in the curriculum. I have learned from experience that better English leads to better jobs and promotions."

"I recommend a course introduction to high power electricity to be applied for present jobs."

"Much more theory and laboratory in the transistor courses would be practical."

"Students need more practical experience as part of the curriculum at Institute of Technology and Vocational Education."

"I was really happy with what I had."

"I would like to have had a technical report writing course."

"Upon my experience, I think more practice work and less theory is important. The only place a person will learn is getting into a piece of the equipment."

"I think someone should go out and see what types of jobs are done by different companies and design studies along with this guideline of work."

"The type of work I do now does not relate to the program that I had but I am still interested in business courses."

"Need more technical course and practical experience which would contribute directly to the electronics program rather than dealing with theory."

"Students need more practical experience as part of the curriculum."

"I appreciate your concern for the former students and hope that you will create new ideas to help former students."

"Students should be counseled every year before graduation on the practicality of his major field."

"I found general education, especially history to be the least useful and suggest replacing them with useful courses."

"More hardware and software should be offered."

"Laboratory and theory should have similarities."

"Seminar or invited guest speakers in special fields would be instructional."

"The school must offer more project courses in the specialized fields to prepare students before graduation."

"Because of lack of curriculum, guidance and counselors, a lot of students fail to enter the University."

"Much more time should be given to the transmission courses."

"Education is the basic guideline needed in order to be able to work. The important thing for students in school is to get more practice in a specialized field or have on-the-job training because that helps the student for the world of work."

"I suggest a mini-thesis project expecially for senior students that would prepare them to be creative."

VITA

Ganitha Kampanrana

Candidate for the Degree of

Doctor of Education

Thesis: DEVELOPMENT AND EVALUATION OF A MODEL FOR CONDUCTING A FOLLOW-UP STUDY OF TECHNICIAN PROGRAM GRADUATES

Major Field: Occupational and Adult Education

Bibliographical:

Personal Data: Born in Bangkok, Thailand, December 28, 1950, the daughter of Pol. Col. Sanun and Mrs. Kurwon Kampanrana.

Education: Graduated High School, Santa Cruz Convent, Bankok, Thailand, in 1967; received Bachelor of Science in Education in Mathematics from the Philippine Women's University, Manila Philippines, in April 1971; received Master of Education degree from Middle Tennessee State University, Murfreesboro, Tennessee, in May, 1975; completed requirements for the Doctor of Education degree at Oklahoma State University in July, 1983.

Professional Experience: Lecturer in General Education, Institute of Technology and Vocational Education, Pho-Chang campus, Bangkok, Thailand, 1971 - 1974 and 1974 - 1978.