A LIMITED STUDY OF THE INTEREST OF ELECTRONIC TECHNOLOGY STUDENTS IN ATTENDING A POST-ASSOCIATE HIGH TECHNOLOGY PROGRAM

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1980

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
May, 1984

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ACKNOWLEDGMENTS

The writer wishes to express his gratitude and sincere appreciation to his adviser, Dr. John Baird for his interest and direction throughout this research; to Dr. Cecil Dugger and Dr. Clyde Knight for their suggestions; to IBM Corporation, who provided the opportunity to try something new without risk; and to the participants of this study for their cooperation.

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CHAPTER I

INTRODUCTION

A technical education program must strive to provide its graduates with a minimum of the types of techniques, applications, and developments currently in practice in industry. Administrators of associate degree programs often find they have no room in their already crowded curriculums to cover new applications of technology. Electronics technology is one discipline that has expanded greatly since the development of the integrated circuit. This field also has close ties to laser applications and to electromechanical devices. Today electronics technology graduates must be prepared to work in more highly technical environments than ever before. Therefore, the problem of having no room in electronics curriculums must be overcome. A strong background in the fundamentals of electronics is needed to understand the operation of high technology types of devices such as lasers and robots. Therefore, educators are reluctant to simply drop old courses to make room for advanced subjects. However, one appealing solution is to offer students the chance to study the high technological advances in a post-associate program.

Statement of Problem

Administrators of at least one two-year college in Oklahoma (Oklahoma State University Technical Institute) would like to offer electronics technology students a post-associate program. These

administrators would like to offer course work in the high technology types of developments present in industry. However, before initiating such a program, administrators need to understand the type and number of electronic technology students who would be willing to enter such a program. The problem with which this study is concerned was the lack of information about the interest of electronics technology students toward attending a post-associate program.

Purpose of the Study

The purpose of this study was to: (1) determine the number of second year electronics technology students enrolled in associate degree electronics technology programs in Oklahoma colleges and technical institutes that are interested in attending a post-associate high technology program; (2) determine selected characteristics of students who express an interest in attending the program; and (3) determine which courses are of most interest to students who express interest in attending the program.

Objectives

The objectives of this study were: (1) to develop a sample high-technology, post-associate curriculum to be used as an example for electronics technology students to determine their interest in attending such a program; (2) to obtain feedback data, through survey techniques, from electronics technology students about the type of post-associate courses they would be interested in studying; and (3) to obtain selected information, through survey techniques, about the characteristics of those electronics technology students interested in attending a post-associate, high technology program.

Scope

The scope of this study was initially limited to students in electronics technology associate degree programs at Oklahoma Junior colleges and Technical institutes and at one four year college. The study was further limited to those programs that would be graduating at least 12 students. The students also must either have been in their last semester of course work or, have had only 12 hours left to complete.

Definition of Terms

The following definition was used in this study:

High Technology: The technical areas relating to microelectronics, robotics, and lasers and the application of these devices to industrial and consumer uses.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The literature reviewed relative to the problem of this research consists of three parts: (a) high technology and technician training; (b) results of similar studies; and (c) summary. The first part deals with the term "high technology" and with studies performed to determine the type of technician training needed for the future. The second section deals with similar research done in the problem area. The last section consists of a summary.

High Technology and Technician Training

Many researchers agree that we are at the beginning of a technical revolution in which many old jobs will change. The scope of this technical revolution is difficult to grasp, McMeen and Wieking (1983) define the process of technological change as consisting of the following three parts:

1. Invention (the creation of a new product or process)
2. Innovation (the introduction of the product or process into use)
3. Diffusion (the spread of that product or process beyond its first use)

Industry, in many cases, is presently in the third phase of this

process of technological change. Innovations such as lasers, robotics, and microelectronics technology, which the authors called high technology devices, are now being used in many applications for which they were not originally designed. It is difficult, however, to determine exactly what qualifies to be termed high technology. The literature reviewed indicates that a precise definition does not exist. For example, Burnham (1981, p. 4) says high technology is ". . . a term used in the latter half of the 70's to denote those recent, sophisticated and complex applications of science such as electronic communications, computers, or biological engineering." Lynch (1982, p. 29), however, discusses how Macomb Community College is entering ". . . the 'high-tech' world of computer aided design, robotics, and word/information processing." Baker (1982, p. 26) uses yet another meaning. He uses the term "microelectronics revolution" and implies that high technology products are those that employ microelectronics. Researchers agree, however, that new occupations are being created and some old ones are becoming obsolete. Hull and Pedrotti (1983) define high technology in terms of the occupations that are created. They state as follows:

> High technology occupations are characterized by heavy involvement with computers, by a systems-oriented emphasis, and by rapidly changing technical content. They all require workers who have a broad base of knowledge, an understanding of basic processes, and the ability to be flexible (p. 29).

Feirer (1983) also recognizes that high technology industries will bring about a need for a newly skilled person who will be able to work in different technical areas including electronics, pneumatics, and machine tool processes. He questions if vocational and technical programs will be able to adjust to these changes. Hull and Pedrotti (1983, p. 29) also voice this concern. They state, "Educational institutions

must move quickly and carefully toward restructuring their curriculums, redesigning their laboratories, and retreading their faculty."

Several studies have been conducted in an attempt to identify the types of knowledge and skills technicians will need in the future. Jaffe (1982) tried to identify the technologies of the 1980's and the impact of these technologies on technical education. He contacted experts in several different technologies and asked them to forecast the technical abilities that technicians will need in the future. These experts indicate that technicians will need a broad base of knowledge in control applications and devices, computers, optics, digital electronics, communications, programming, and robotics.

The need for technicians with a broad base of technical knowledge was seen by Rooney, Phillips, and Tinnell (1972) as being of prime importance to industry. They define three generations of technical occupations as existing in industry. The first generation was job oriented and involved well defined tasks for workers such as machinists and carpenters. The second generation was limited to specific fields such as electronics, mechanics, and construction. The third generation, which they believe industry is currently in, are technical occupations that are systems oriented and consist of combinations of skills from various technologies. The knowledge areas these authors recommend in their electromechanical technology program are very similar to those recommended by Tanner (cited by Jaffe, 1982) as being required by technicians to work with robots, he states:

> Knowledge areas in robot mechanisms and control design will include: electromechanical devices and systems such as automatic control systems and servomechanisms; fluid power devices and systems; solid state electronics; and computers and microprocessors. Specific knowledge requirements will include: electric dc servo drives; position and velocity

> measuring devices; fluid power actuators and control devices; computer and microprocessor circuits, software, and programming; and analogue-to-digital and digital-to-analogue conversion (p. 48).

Hull and Pedrotti (1983, p. 29) also believe technicians need a broad base of knowledge. They say the technician that industry will be most interested in hiring in the near future will be the one who can ". . . install, operate, maintain, and repair systems that incorporate combinations of electrical motors, digital circuits, mechanisms, hydraulic actuators, lenses, light sources, and transducers."

Results of Similar Studies

The literature reviewed relative to the problem of crowded curriculums suggest that education must become more efficient. Joseph (1979, p. 2) describes knowledge as growing increasingly rapid and therefore society becomes more dependent upon education. He says,". . . the present trends point in only one direction. We need to raise the productivity of education so that we have the means to deliver more education." Sappington and Miller (1980) used this same philosophy when they studied the effectiveness of only teaching one method of network analysis to their electronics technology students. They state:

> Recent developments in the field of electronics have underlined the need for the efficient allocation and utilization of instructional time within electronics technology courses. The industrial technology teacher is caught in a dilemma. As the study of new devices and techniques is added to the curriculum, other areas must either be deleted or receive less emphasis if the program is to function within the same time constraints (p. 37).

Joseph (1979) suggests that, because of the rapid technical advances of society, a life-long approach to all forms of education will be necessary in the near future. Yeager (1984), who is head of electronics

technology at Oklahoma State University Technical Institute in Oklahoma City Oklahoma, also recognizes the problem of overcrowded associate degree electronics technology curriculums. He believes the problem could be solved at his school by offering a program of coursework beyond the associate degree. Some of the courses he believes should be offered in this post-associate type program are courses in robotics and lasers.

Baker (1970) studied the feasibility of establishing a post-associate program for electronics calibration technicians. His study was divided into two main phases. The first phase involved collecting information from manufacturing and service companies as to their need for electronics calibration technicians. The second phase concerned collecting information from prospective students as to their interest in attending the program. To determine the student interest, 1,050 second year electronics students at 51 schools in 19 states were surveyed. The survey instrument was mailed to the heads of the electronics technology departments. The instrument required the department head to read a short description of the program to second year students and ask for a show of hands of those who would be interested in attending the program. This information was recorded by the department head and returned back to the researcher.

Summary

Studies indicate that the technician who will be in demand in the future will be the individual that has a broad base of technical knowledge. Included within this broad base will be hydraulic systems, electromechanical systems, robotics, lasers, control devices, mechanisms, digital electronics, and microcomputers. It is apparent that the

technician who studies robotics will inherently receive knowledge in many of these areas. The problem of crowded electronics technology curriculums has been noted by other researchers. These researchers recommend solving the problem by making the educational process more efficient, thus freeing up time to cover more subjects.

CHAPTER III

METHOD AND PROCEDURES

Introduction

The purpose of this study was to: (1) determine the number of second year electronics technology students enrolled in associate degree electronics technology programs in Oklahoma colleges and technical institutes that are interested in attending a post-associate high technology program; (2) determine selected characteristics of students who express an interest in attending the program; and (3) determine which courses are of most interest to students who express interest in attending the program.

Selection of Subjects

This study was limited to students at 12 Oklahoma junior colleges and technical institutes listed in the Technician Education Yearbook (1982) Prakken Publications, as offering associate degrees in electronics technology. Only one four year college was included in the study (Cameron University) because the electronics technology program offered by this school was more nearly associated with a traditional two-year program than a two-year plus two-year B.S. program. To be included in the study a school had to have at least 12 or more students enrolled in their last semester of course work. This limit was placed on the study by the researcher and his academic committee, because it

was believed that the students who were ready to graduate would have more realistic opinions about attending the post-associate program than other students. Students who had only 12 or fewer semester hours left to complete their degree were also included in the study.

Telephone calls were made to electronics technology department heads of each of the 13 schools in order to obtain answers to the following three questions:

1. How many students in electronics technology will graduate at the end of the 1984 Spring semester?

2. How many credit hours are required by the program for an associate degree?

3. Would it be possible to administer a questionnaire to the students?

Question two was asked in order to determine if there were programs that already required students to complete more than 2 years of course work before being awarded an associate degree.

Development of the Instrument

A questionnaire (see Appendix A) was developed in order to determine the characteristics of the students who are interested in attending the program and the courses they are most interested in studying. The questionnaire was divided into 3 main parts. The first part of the questionnaire (questions 1 through 11) dealt with personal data about the respondent. Questions 3,4,5, and 9 were used to differentiate respondents that did not meet the criteria of subjects of the study. The second part of the questionnaire (questions 12 and 13) asked questions relative to the student's interest in the program. The third

section presented the respondent with a proposed high technology program and with course descriptions. It was hoped that this would better help the respondent make a decision as to their interest in attending the program. Also, all courses described in the program were listed for the student (question 14) and the students were asked to indicate the courses that were of most interest to them. This information was helpful in determining the courses that students were most interested in studying. The courses that made up the high technology program were developed from a literature review relative to future technician education and training needs. The questionnaire was piloted with 40 freshman electronics technology students at Oklahoma State University. Corrections were made and the instrument was presented to the head of electronics technology at Oklahoma State University Technical Institute, located in Oklahoma City, Oklahoma, for his review and recommendations. The final draft of the questionnaire was then developed and a copy is shown in Appendix A.

Method of Analysis

The data collected relative to the characteristics of the students interested in the program was analyzed using chi-square tests at the 5 percent level of significance to answer the following four null hypothesis:

1. H_0 : There is no significant difference between the age of the respondents and their expressed interest in attending the program.

2. H_0 : There is no significant difference between the sex of the respondents and their expressed interest in attending the program.

3. H_0 : There is no significant difference between the respondents past work experience and their expressed interest in attending the program.

4. H_0 : There is no significant difference between the respondents present work experience and their expressed interest in attending the program.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

The results of this study of the expressed interest of electronics technology students in attending a post-associate high technology program is divided into the following four sections: (1) The results of the telephone inquiries of the electronic technology department heads are presented. (2) The interest of the students in attending the program is discussed. (3) The courses that are of most interest to the students are named. (4) The results of the chi-square analysis of the characteristics of the students who express an interest in attending are presented.

Results of the Telephone Inquiries

Only three schools of the 12 identified fit the criteria of subjects for this study. Two schools, not included in the study, already offer course work which is comparable to the three-year associate degree program in number of credit hours. Brooks (1983), electronics technology head at Rose State College in Midwest City, Oklahoma, says that his program requires 84 credit hours for an associate degree while Lyons (1984) of Oklahoma State School of Technical Training in Okmulgee, Oklahoma indicated that 90 credit hours were needed for an associate degree in his electronics program. Both of the department heads indicated that

their programs already offer high technology courses similar to to those described in the questionnaire. Because of this information these two schools were left out of the study. The final three schools used in this study were Cameron University, Northeastern Oklahoma A&M College, and Oklahoma State University Technical Institute.

Student Interest in the Program

The three schools and the number of students at each school that fit the criteria of subjects of this study are shown in Table I. The total number of students that participated in this study was 50. The largest percentage (40 percent) of the students that participated in this study were from Cameron University. The number of students interested in attending the high technology program are also shown in Table I. Results revealed that 38 of the 50 respondents (76 percent) were interested in attending the post-associate program. Twenty-seven of the fifty respondents (54 percent) expressed an interest in attending the program on a part-time basis. The probable reasons students were more interested in attending the program on a part-time basis were brought out by questions 10 and 11. Question 10 ask the respondents to identify a response that best described their purpose for attending college. Question 11 ask students to identify a response that best described their short-term plans upon graduation. Results of questions 10 and 11 are tabulated in Table II and Table III respectively. Sixty-two percent of the respondents indicated that their chief reason for attending college was to get a job upon graduation. However, only 16 percent of the total respondents indicated that they will not continue their education upon graduation. Eighty-four percent of the students

TABLE I

NUMBER OF STUDENTS EXPRESSING AN INTEREST IN ATTENDING THE POST-ASSOCIATE HIGH TECHNOLOGY PROGRAM BY HOME COLLEGE

College	Total Number		Interest of Students in Attending Program					
			Full-time		Part-time		No Interest	
	N	Percent	N	Percent	N	Percent	N	Percent
Cameron University	20	40	3	6	11	22	6	12
Northeastern Oklahoma A & M College	18	36	6	12	9	18	3	6
Oklahoma State University Technical Institute	12	24	2	4	7	14	3	6
TOTAL	50	100	11	22	27	54	12	24

TABLE II

RESULTS OF RESPONDENTS PURPOSE FOR ATTENDING COLLEGE

Purpose	Interest in Attending the Program: Full-time N	Full-time Percent	Part-time N	Part-time Percent	No interest N	No interest Percent
Upgrade myself	0	0	3	6	4	8
Get a good job	10	20	15	30	6	12
Transfer to a 4-year school	1	2	6	12	2	4
Other	0	0	3	6	0	0
TOTAL	11	22	27	54	12	24

TABLE III

RESULTS OF RESPONDENTS SHORT-TERM PLANS AFTER GRADUATION

Short-term Plans	Interest in Attending the Program: Full-time N	Full-time Percent	Part-time N	Part-time Percent	No interest N	No interest Percent
Work on a B.S Degree	3	6	4	8	2	4
Continue present job	0	0	2	4	3	6
Work and work on B.S. Part-time	6	12	17	34	4	8
Find a job	1	2	1	2	1	2
Other	1	2	3	6	2	4
TOTAL	11	22	27	54	12	24

plan to seek additional education after graduation. Fifty-four percent of the respondents plan to work and pursue a B.S. degree part-time upon graduation. Other responses to questions 10 and 11 which were too varied and ambiguous to tabulate within the format of this study but are presented in Appendix B.

Table IV presents the responses of the students to question 13 which ask the students to identify factors that would most influence their decision to attend the proposed program. Twenty-six percent of the respondents indicated that the distance traveled was the key factor that would influence their decision. Twenty-four percent of the students indicated that the cost of the program was the key factor while 20 percent of the students pointed to the salary of the program graduates as the key factor. Ten percent of the respondents (all interested in attending the program part-time) were interested in the opportunity for advancement that the program would be able to give them on their jobs. The factor of least importance was the hours that the courses would be offered. Responses written in the option section to question 13 were too ambiguous and varied to catagorize, but are presented in Appendix B. Two of the respondents indicated that a key factor for them would be if they were able to receive financial benefits from the Veterans Administration if they attended the program.

Interest of Students in Courses Offered

Information in Table V reveals the student interest in the sample program courses relative to the students interest in attending the program. Of the students interested in attending the program full-time, 20.0 percent indicated an interest in Lasers II and 16.6 percent

TABLE IV

FACTORS THAT INFLUENCE STUDENTS DECISION TO ATTEND
THE HIGH TECHNOLOGY PROGRAM

Factors	Interest in Attending the Program					
	Full-time		Part-time		No interest	
	N	Percent	N	Percent	N	Percent
Salary of the program graduates	0	0	5	10	5	10
Distance traveled to attend	3	6	7	14	3	6
Cost of the program	7	14	4	8	1	2
Hours the courses are offered	0	0	3	6	0	0
Opportunity for advancement	0	0	5	10	0	0
Other	1	2	3	6	3	6
TOTAL	11	22	27	54	12	24

TABLE V

INTEREST OF THE STUDENTS IN COURSES THAT WERE PRESENTED IN THE SAMPLE PROGRAM

Courses presented	Interest in Attending the Program					
	Full-time		Part-time		No interest	
	N	Percent	N	Percent	N	Percent
Hydraulics & Pneumatics	4	6.7	11	6.7	2	4.5
Robotics I	9	15.0	25	15.3	6	13.6
Lasers I	10	16.7	20	12.3	6	13.6
Advanced Microcomputers	5	8.3	14	8.6	6	13.6
Sensers & Amplifiers	3	5.0	13	8.0	3	6.8
Control Circuits	3	5.0	15	9.2	3	6.8
Optronics	6	10.0	15	9.2	6	13.6
Robotics II	7	11.7	22	13.5	5	11.4
Technical Writing	1	1.7	8	4.9	2	4.5
Lasers II	12	20.0	20	12.3	5	11.4
TOTAL	90	100.0	163	100.0	44	100.0

indicated an interest in Lasers I. Fifteen percent of these respondents indicated they were interested in Robotics I. The reason more students were interested in Lasers II than in Lasers I may have been because several students at Oklahoma State University Technical Institute, while answering the questionnaire, stated that they had already taken a Lasers I course offered by the physics department at that school. The course of least interest to these respondents was Technical Writing.

Of the students interested in attending the program part-time, 15.3 percent indicated that they were interested in Robotics I and 13.5 percent were interested in Robotics II. A total of 12.3 percent, of the same part-time group, indicated they were interested in Lasers I and Lasers II. The course of least interest to these students was Technical Writing. Only 4.9 percent of the students expressing interest in attending the program part-time were interested in this course. The students who were not interested in attending the entire proposed program did indicate an interest in Robotics I, Lasers I, and Advanced microcomputer applications. The courses of least interest to these respondents were Technical Writing and Hydraulics and Pneumatics.

Characteristics of the Students

In order to determine if there was any significant difference between respondents age, sex, and work experience and the respondents interest in attending the high technology program, four chi-square tests of significance were run and the results are presented in four tables.

Table VI presents information from a the chi-square test of significance used to determine if there was a difference between the four age groups of the respondents and their interest in attending

TABLE VI

CHI-SQUARE (χ^2) TABLE - THERE IS NO SIGNIFICANT DIFFERENCE BETWEEN STUDENT AGE AND INTEREST IN ATTENDING THE PROGRAM

Interest	19-21	22-24	25-27	28 & above	Degrees of Freedom	Calculated χ^2	Distribution Value χ^2 0.05
Full-time	8	2	1	0			
Part-time	16	0	6	5			
No Interest	6	3	0	3	6	9.82	12.59
TOTAL	30	5	7	8			

Since χ^2 0.05 = 12.59 and the calculated χ^2 = 9.82 < 12.59 the null hypothesis of there being no significant difference between age and interest in attending the program is accepted.

the program. A total of 24 respondents in the 19 to 21 age group indicated interest in attending the program. This represents 48.0 percent of the total respondents. Therefore, the students in this age group might seem to have had greater interest in attending the program than do respondents within the other age groups. However, all respondents within the 25 to 27 age group indicated they were interested in attending the program. Almost half of the number of respondents in the 22-24 age group indicated interest in attending the program and an equal portion indicated no interest. This was also the case with the 28 and above age group. These two factors were chiefly responsible for the acceptance of the null hypothesis which states that there is no significant difference between respondents age group and interest in attending the program.

The findings also revealed that there was no significant difference between the sex of the respondents and their interest in attending a post-associate program. This information is presented in Table VII. Although there was no difference in proportion of interest, it may be assumed that there would be more males than females enrolled in a high technology program because there are currently more males enrolled in electronics technology programs.

Table VIII presents the chi-square test of significance for the null hypothesis that there is no significant difference between the respondents past work experience and their interest in attending the program. This null hypothesis was also accepted. It is of interest to note that none of the respondents who worked for more than one year were interested in attending the program full-time. This may be because these students would be more apt to have financial responsibilities

TABLE VII

CHI-SQUARE (χ^2) TABLE - THERE IS NO SIGNIFICANT DIFFERENCE BETWEEN THE SEX OF THE RESPONDENTS AND THEIR EXPRESSED INTEREST IN ATTENDING THE PROGRAM

Interest in Attending the Program	SEX		Degrees of Freedom	Calculated χ^2	Distribution Value $\chi^2_{0.05}$
	Female	Male			
Full-time	0	11			
Part-time	3	24			
			2	3.44	5.99
No Interest	3	9			
TOTAL	6	44			

Since $\chi^2_{0.05} = 5.99$ and the calculated $\chi^2 = 3.44 < 5.99$ the null hypothesis of there being no significant difference between the sex of the respondents and their expressed interest in attending the program is accepted.

TABLE VIII

CHI-SQUARE (χ^2) TABLE - THERE IS NO SIGNIFICANT DIFFERENCE BETWEEN A STUDENT'S PAST WORK EXPERIENCE AND INTEREST IN ATTENDING THE PROGRAM

Interest in Attending the Program	Work Experience of More Than One Year	No Work Experience	Degrees of Freedom	Calculated χ^2	Distribution Value $\chi^2_{0.05}$
Full-time	0	11			
Part-time	8	19			
No Interest	5	7	2	5.58	5.99
TOTAL	13	37			

Since $\chi^2_{0.05} = 5.99$ and the calculated $\chi^2 = 5.58 < 5.99$ the null hypothesis of there being no significant difference between the respondents past work experience and their expressed interest in attending the program is accepted.

which would not allow them to attend school on a full-time basis. Eleven students of the 37 respondents who have no work experience indicate an interest in continuing their education on a full-time basis.

A presentation of the chi-square test of significance for the null hypothesis stating that there is no significant difference between the respondents present work experience and their expressed interest in attending the program is shown in Table IX. Again the null hypothesis was accepted. Of the students that were working when the questionnaire was administered, none indicated an interest in attending the program full-time. A total of 37 of the 50 students surveyed indicated that they were not working when the questionnaire was administered.

Question 6 ask the respondents if they were Oklahoma residents. Only two respondents indicated that they were not Oklahoma residents.

TABLE IX

CHI-SQUARE (χ^2) TABLE - THERE IS NO SIGNIFICANT DIFFERENCE BETWEEN THE RESPONDENTS PRESENT WORK EXPERIENCE AND THEIR EXPRESSED INTEREST IN ATTENDING THE PROGRAM

Interest in Attending the Program	Presently Working			Degrees of Freedom	Calculated χ^2	Distribution Value $\chi^2_{0.05}$
	Full-time	Part-time	No			
Full-time	0	3	8	4	4.98	9.48
Part-time	3	2	22			
No Interest	2	3	7			
TOTAL	5	8	37			

Since $\chi^2_{0.05} = 9.48$ and the calculated $\chi^2 = 4.98 < 9.48$ the null hypothesis of there being no difference between the respondents present work experience and his expressed interest in attending the program is accepted.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the number of electronics technology students that would be interested in attending a post-associate high technology program. Also, data about the courses of most interest to the students was collected. The final purpose of the study was to determine selected characteristics about the students, such as age, sex, and work experience, and their expressed interest in the program.

Summary

To accomplish the purpose of this study, a questionnaire which contained an example curriculum for the respondents review was developed. The example curriculum was reviewed by the respondents so that a more realistic opinion might be obtained about the respondents interest in the program. The subjects of the study were (1) second year electronics technology students expecting to graduate with an associate degree in the Spring semester 1984 and (2) were currently enrolled in a school that planned to graduate at least 12 students in electronics technology in the Spring semester 1984. In addition, students who would not graduate in the Spring semester 1984, but who had 12 or fewer hours to graduate were also included.

The schools and subjects chosen for this study were identified by

telephone inquiries with the electronics technology department heads of 13 Oklahoma colleges. Fifty students at three Oklahoma colleges were eventually identified as subjects for the study. The researcher administered the questionnaire in person so that more control could be gained on the responses to the questionnaire.

Data obtained from the questionnaire were tabulated and analyzed with respect to the purpose of the study. In order to determine if there were any identifiable characteristics associated with the sex, ages, and work experience of the respondents and their interest in attending the program, chi-square test of significance were used.

Results revealed that 22 percent of the students were interested in attending the program on a full-time basis whereas 54 percent were interested in attending the program on a part-time basis. Fifty percent of those respondents interested in attending the program full-time were from Northeastern Oklahoma A&M College. Additional data revealed that 84 percent of the respondents planned to continue their education beyond an associate degree. The key factors that would influence the respondents decision to attend the high technology program was the distance students would need to travel to attend the program and the cost of attending the program.

The courses which were of greatest interest to the respondents were Lasers and Robotics. Technical writing was the course least interested in by the respondents.

There was no significant difference between the ages, sex, or work experience of the respondents and their expressed interest in attending the program. Table VI through Table IX present the chi-square test of significance for each of the characteristics. There were many more

males than females enrolled in electronics technology programs, therefore, most of the students who would attend the high technology program would be male.

Conclusions

Findings of this study indicate that there is a high demand for a post-associate high technology program. Results show that students would be interested in attending the program and that considerable enrollment could be expected. More students would be interested in attending the program on a part-time basis than a full-time basis which might force administrators of such a program to offer courses at hours convenient for working students. It was noted that Northeastern Oklahoma A&M College had the largest number of students expressing an interest in attending the proposed program full-time. This may have been because of the lack of electronics industry in the area serviced by the college. Students at schools not included in this study might also show a high level of interest in attending the program on a full-time basis because many of these schools also exist in areas that have a low number of electronics related industries. The study also showed that there was a high level of interest in all but one of the courses proposed in the sample curriculum. The type of student that would be interested in attending the program could not be characterized by sex, age, or work experience in this study. Two schools outside of the selected schools surveyed were identified as already requiring students to complete more hours and attend school longer than the traditional two year requirement for an associate degree. It was pointed out to the respondents, by the researcher, that credit earned in a post-associate

program would not be transferable to a four year degree. The results of this study however, seem to indicate that this would not effect many students' decisions toward attending a post-associate high technology program.

Recommendations

On the basis of the information contained in this study a college should seriously consider implementing a post-associate high technology program if the following conditions exist:

1. The program would need to be offered within commuting distance of those employees who work in industries that express a need for post-associate high technology graduates. There would further need to be differential reward for those employees who advance their education in a post-associate program.

2. The school would need to provide flexibility in their scheduling of high technology courses to accommodate the work schedules of part-time students.

A study should be conducted to determine the interest of industry in employing post-associate high technology graduates, approximate salaries, and the job titles such graduates could expect.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE

SURVEY OF OKLAHOMA ASSOCIATE DEGREE ELECTRONICS TECHNOLOGY CANDIDATES

This survey is for the purpose of learning more about the interest of electronics technology students in attending a one year, post-associate degree, high technology program. Your responses to this questionnaire would be very helpful in determining the potential success of such a program.

Please circle the number of the most accurate response to each of the questions, or fill in the blanks as indicated.

GENERAL INFORMATION

1. Please indicate your age.
   __ __ Years of age

2. Please indicate your sex.
   1. Female 2. Male

3. Are you majoring in electronics technology?
   1. Yes 2. No

4. Will you graduate with an associate degree at the end of the current semester?
   1. Yes 2. No

5. Please indicate the total number of hours (including the hours you are currently enrolled in) that you have left to complete before you receive your associate degree.
   __ __ Hours to complete

6. Are you an Oklahoma resident?
   1. Yes 2. No

7. Have you ever worked for one year or more within the electronics field or with an electronics related industry?
   1. Yes 2. No

8. Do you presently work within the electronics field or with an electronics related industry?
   1. Yes, full-time
   2. Yes, part-time
   3. No

9. Are you enrolled as a full-time student?
   1. Yes 2. No

10. Which of the following best describes your purpose for attending college?
    1. To upgrade myself for my present employer.
    2. To get a good entry level job upon graduation.
    3. To prepare for transfering to a 4-year program.
    4. Other_____

11. Which of the following best describes your short-term plans upon graduation?
    1. Transfer to a 4-year school to work on a B.S. degree.
    2. Continue working with my current employer.
    3. Find a job first and work on a B.S. degree part-time.
    4. Find a job, I have no plans to pursue my education beyond an associate degree.
    5. Other_____

INTEREST IN THE HIGH TECHNOLOGY PROGRAM

THE FOLLOWING QUESTIONS DEAL WITH THE HIGH TECHNOLOGY PROGRAM. THE PROGRAM WOULD INCLUDE COURSES SIMILAR TO THE ONES LISTED BELOW. THE COURSE DESCRIPTIONS CAN BE FOUND AT THE END OF THE QUESTIONAIRE.

NOTE: PLEASE NOTE THAT CREDIT EARNED IN SUCH A PROGRAM WILL NOT BE TRANSFERABLE TO A 4-YEAR PROGRAM IN THE STATE OF OKLAHOMA!!!!

SEMESTER I	SEMESTER II
EHT 2093 Hydraulics & Pneumatics	EHT 2594 Control circuits & devices
EHT 2193 Robotics I	EHT 2693 Optronics
EHT 2294 Lasers I	EHT 2794 Robotics II
EHT 2393 Advanced microcomputer principles	EHT 2893 Technical Writing
EHT 2494 Sensers and amplifiers	EHT 2993 Lasers II
17 hours	17 hours

12. If the above program was offered at a school in Oklahoma, and a certificate was awarded upon graduation, how interested would you be in transfering to the program after you graduate with your associate degree?
    1. I would be interested in transfering to the program as a full-time student.
    2. I would be interested in transfering to the program as a part-time student.
    3. I would not be interested in attending the program.

13. Which of the following factors would most influence your decision to enroll in a high technology program, such as this? You may circle more than one response but please put a check beside the one of greatest importance.
    1. Salary of the program graduates
    2. Distance I would have to travel to attend the program
    3. Cost of the program
    4. Hours the courses were offered (day, evening)
    5. Opportunity for advancement
    6. Other _____

14. Which of the courses listed in the program are of greatest interest to you? (Put a check beside the courses that are of most interest to you.)

SEMESTER I	SEMESTER II
__EHT 2093 Hydraulics & Pneumatics	__EHT 2594 Control circuits
__EHT 2193 Robotics I	__EHT 2693 Optronics
__EHT 2294 Lasers I	__EHT 2794 Robotics II
__EHT 2393 Advanced microcomputers appl.	__EHT 2893 Technical Writing
__EHT 2494 Sensers and amplifiers	__EHT 2993 Lasers II

COURSE DESCRIPTIONS

EHT 2093 Hydraulics and Pneumatics Prerequisite - none, Lecture 2 hrs./wk. Lab 3 hrs./wk. Introduction to the principles of hydraulic and pneumatic devices. Study of the analogies of electronic devices to hydraulic and pneumatic devices. Principles of vacuum systems is also covered.

EHT 2193 Robotics I Prerequisite - none. Lecture 2 hrs/wk. Lab 3 hrs/wk. Introduction to robots and robot systems. Study of mechanics, linkages and drives and their uses in robots and other electromechanical devices.

EHT 2294 Lasers I Prerequisite - associate degree in electronics or equivalent. Lecture 3 hrs./wk. Lab 3 hrs./wk. Introduction to lasers and their properties. Explores laser and laser theory, He-Ne gas laser operation, laser physics, laser light properties, laser safety.

EHT 2393 Advanced microcomputer principles Prerequisite - digital electronics background and microcomputer background. Lecture 2 hrs./wk, Lab 3 hrs./wk. A study of microcomputers interfaced to devices and peripherials. Specialized software needed to integrate the computer with other devices. Debugging problems, including clocking problems, use of software to debug, use of the logic analyzer to debug.

EHT 2494 Sensers and Amplifiers Prerequisite - A beginning amplifiers course. Lecture 3 hrs./wk. Exploration of the types of transducers and amplifiers used in control and sensing applications. Introduction to operational IC amplifiers.

EHT 2594 Control Circuits and Devices Prerequisite - EHT 2494 and an associate degree or equivalent in electronics technology. Lecture 3 hrs./wk. Lab 3 hrs./wk. Investigation of feedback control devices and techniques, stepper motors, relays, SCR's. Study of how these devices are used to control systems. Investigation of response times.

EHT 2693 Optronics Prerequisite - Associate degree or equivalent in electronics technology. Lecture 2 hrs./wk. Lab 3 hrs./wk. This course investigates optoelectronic devices and properties. The use of light to detect motion, speed of rotation. Light detector devices and response times. Application of L.E.D.'s. Application of photocoupled data aquisition systems and transmission systems.

EHT 2794 Robotics II Prerequisite - Associate degree in EET or equivalent and EHT 2093 and EHT 2193. Lecture 3 hrs./wk. Lab 3 hrs./wk. Advance study of robotics, subjects covered include the programming of robots to move efficiently, advantages and disadvantages of robots. Analysis of calibration problems and techniques.

EHT 2893 Technical Writing Prerequisite - none. Lecture 3 hrs./wk. This course investigates the use of technical writing to develop specifications and interpretation of specifications. Presentation of problems and solutions and use of technical writing as it applies to letter writing and development of status reports.

APPENDIX B

WRITTEN RESPONSES TO QUESTIONS 10, 11, AND 13

WRITTEN RESPONSES TO QUESTION 10

The following three statements were written, by the respondents, in response to question 10. Question 10 ask the respondents to state their reasons for attending college.

1. To prepare for a better job
2. Enter job continue school
3. Don't remember

WRITTEN RESPONSES TO QUESTION 11

The following six statements were written, by the respondents, in response to questin 11. Question 11 ask the respondents to state their short-term goals upon graduation.

1. Find a job work on master degree
2. Electrical Engineering is best bet
3. Find a job first and work on a B.S. fulltime
4. Look for a job, if not continue education
5. Change major and go to another school
6. 1 and 2 (this refers to responses 1 and 2 of question 11)

WRITTEN RESPONSES TO QUESTION 13

The following seven statements were written, by the respondents, in response to question 13. Question 13 ask the respondents to indicate the factor that would most influence their decision to attend the proposed high technology program.

1. Not very interested in any of the courses
2. Excepting under V.A.
3. None offering a masters degree
4. No interest
5. Credit hours
6. The credits don't apply to degree
7. V.A. approval

VITA 2

Mark Allen Phillips

Candidate for the Degree of

Master of Science

Thesis: A LIMITED STUDY OF THE INTEREST OF ELECTRONIC TECHNOLOGY STUDENTS IN ATTENDING A POST-ASSOCIATE HIGH TECHNOLOGY PROGRAM

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