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# A Follow-up Study of Technology Education Graduates of Old Dominion University 1986-1996

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# A FOLLOW-UP STUDY OF TECHNOLOGY EDUCATION GRADUATES OF OLD DOMINION UNIVERSITY 1986-1996

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By

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SIGNATURE PAGE

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# CHAPTER I

## INTRODUCTION

The Technology Education field of study was born in the late 1800s, at the time of the Industrial Revolution. The massive immigration to the United States during this period forced educators to modify their curriculum to serve the children of the working class (Alkin, 1992, p. 1389). The ensuing program, known initially as Manual Arts, became known as Industrial Arts in the 1950s and 1960s. In the 1970s, leaders in the profession began to call for curriculum reform. They believed that this field of study should focus on technological systems and their impact on society. Unfortunately, the profession remained static, lacking much needed direction and a unified perspective for future goals. In 1979-1980, a 21 person team comprised of industrial arts education leaders reached a consensus about future direction in their profession. The group's report described technology as a distinctly human phenomenon that should become a significant field of study in schools (Alkin, 1992, p. 1390).

Old Dominion University (ODU) first offered an Industrial Arts program in 1962. The curriculum has been continually revised. The University offered a Bachelor of Science in Secondary Education-- Industrial Education major, with an Industrial Arts Education Emphasis in 1986 (ODU, 1986, p 87). Later, in 1988, ODU terminated the Industrial

Arts Education emphasis program name and a Technology Education program was born. The curriculum remained virtually unchanged however, until 1989 when ODU offered a Bachelor of Science—Occupational and Technical Studies Major, with a Technology Education Teacher Certification Emphasis (ODU, 1989, p. 89).

This study was formulated with the intent to use feedback from the graduates of the Technology Education program at Old Dominion University to assess the effectiveness of the program bases on post-graduate experiences as teachers.

## Statement of the Problem

The problem of this study was to determine the attitudes of Old Dominion University undergraduates, who graduated from the Technology Education Program between 1986 and 1996, to ascertain if they were adequately prepared to assume teaching positions.

## Research Goals

Through the follow-up study, data was collected toward fulfilling the following objectives:

1. To determine if graduates of Old Dominion University's Technology Education Undergraduate Program were adequately prepared to assume teaching positions.

2. To determine whether the goals established in the college's conceptual framework were being attained.

3. To determine if these graduates are teaching traditional vocational programs or technology education.

4. To determine what improvements can be made to the undergraduate curriculum at Old Dominion University based upon graduate's feedback.

## Background and Significance

The periodic evaluation of curriculum is key to an educational institution's ability to provide skilled and knowledgeable graduates to enter the work force. Post-graduate follow-up is a critical step toward the revision of old curriculum and to the identification of the requirement for, and development of, new curriculum. "Follow-up studies of graduates of the curriculum and/or their associates is very important if a summative evaluation is to have any real validity" (Zais, 1976, pp. 389-390). Feedback gained through customer surveys have led to improvements in virtually every market. Due to the extensive changes in the workplace over the past twenty years, and the exponential growth of technology, any curricula in the technology field of study should be evaluated periodically to ensure its relevance to the customer. In the case of this study, the customers are graduates of Old Dominion University, future Technology

Education teachers, their employers, and their students. The Technology Education Program at Old Dominion University began in 1962 (known then as Industrial Arts), but there is no record of any formal post-graduate follow-up within the last ten years that could be used for program improvement. Therefore, this study may provide the requisite data to lead to possible curriculum improvement.

## Limitations

The following limitations were recognized to have an effect on this study:

1. The study was limited to graduates of Old Dominion University's Technology Education program.

2. The study was limited to data collected through a survey.

3. The study was limited to graduates from 1986 to 1996.

## Assumptions

The results of this study were based on the following assumptions:

1. It was assumed that all persons who responded to the survey answered the questions truthfully.

2. Non-respondents were not employed as technology education teachers.

3. Old Dominion's technology education program change in 1989 was directed toward the needs of graduates, school systems, and the profession.

## Procedures

A survey, consisting of open and closed questions, was developed with the intentions of answering the previously stated research goals. A list of graduates, meeting the research criteria, was compiled from information gained through the Alumni Affairs Office. The survey, a cover letter, and a self-addressed stamped envelope were mailed to each graduate with a known address. The data was then analyzed to determine whether changes in the Technology Education program were needed.

## Definition of Terms

The following terms are defined to ensure that the readers of this study understand their intended meaning:

| | |
|---|---|
| Alumni | Persons who graduated from ODU's undergraduate technology education program between 1986 and 1996. |
| Industrial Arts | A subject of study aimed at developing the manual and technical skills required to work with tools and machinery. |

| | |
|---|---|
| Technology Education | Technology Education is a comprehensive, action-based program concerned with technological means, their evolution, utilization, and significance; with industry, its organization, personnel, systems, techniques, resources, and products; and their social/cultural impact (ITEA, 1985). |
| Technology Education Program | The curriculum followed by a college student to earn a degree in Technology Education. |

## Summary and Overview

Chapter I was comprised of an introduction to Old Dominion University's Technology Education Program and its origins. The study was a descriptive study designed to determine graduates' attitudes toward the effectiveness of the program. Additionally, the researcher hoped to offer suggestions for improvement and to determine if respondents were teaching traditional vocational programs or technology education. Chapter II consists of a review of pertinent literature in the field of technology education. Chapter III explains the methods and procedures used to collect and analyze data. Chapter IV is a summary of the findings that

were gathered by the survey, and Chapter V summarizes the study and makes conclusions and recommendations for future study.

# CHAPTER II

## REVIEW OF LITERATURE

The purpose of this chapter is to provide the reader with an in-depth review of the pertinent background information related to this study. It has been organized into three sections. The first section will highlight the accreditation conditions as required by the National Council for the Accreditation of Teacher Education (NCATE). The second section will be an overview of teacher education at the Darden College of Education, Old Dominion University. The third and final section will describe the present technology education program at Old Dominion University (ODU).

For background knowledge, it is important to familiarize the reader with the factors that have lead educators to focus their efforts on technology education vice vocational or industrial arts training. Since the 1960's, our economy has been significantly changed. We have moved from a mass production economy to a service-based, information dominated economy. According to Carnevale, the performance of the new economy can be measured by five standards: quality, variety, customization, convenience, and timeliness. This trend required different skills in the workforce, namely: academic basics, adaptability, self-management, communication, and influencing (ASBJ, 1991, p. 3). Academic basics include

reading, writing, and computation; adaptive skills include learning to learn, creative thinking, and problem solving; self management skills include self esteem, goal setting, motivation, employability, and career development; communication skills are listening and oral communication; influencing skills include organizational effectiveness and leadership (American School Board Journal, 1991, p. 1). Professional educators in the field of technology education were sensitive to the changes in the nation's economy and society. The result was a restructuring of the curriculum, methods, and certification requirements within teacher education programs.

**The National Council on Accreditation of Teacher Education**

NCATE adopts standards and procedures for accreditation and determines the accreditation status of colleges and university units that prepare teachers and other professional school personnel for elementary and secondary levels. Old Dominion University's Technology Teacher Education program accreditation was approved in August, 1993 by NCATE. NCATE is authorized by the Council on Post-secondary Accreditation (CTTE, 1992, p. 14).

The International Technology Education Association (ITEA) and the Council on Technology Teacher Education (CTTE) developed guidelines for colleges and universities to follow

in order to receive NCATE's accreditation approval. These guidelines were developed with the understanding that appropriate definitions of technology and technology education have been identified and that the technology education program supports these definitions (CTTE, 1992, p. 1).

Technology Education was defined in the Definition of Terms section of Chapter I of this research problem. For continuity purposes, this definition was restated here. Technology Education is a comprehensive, action-based program concerned with technological means, their evolution, utilization, and significance; with industry, its organization, personnel, systems, techniques, resources, and products; and their social/cultural impact (ITEA, 1985).

ITEA/CTTE additionally describes technology education as an applied discipline designed to promote literacy at all levels. The intent is to provide students with an understanding of their technological culture so they may become intelligent consumers of their technology. Therefore, the program is steeped in problem solving, which requires individuals to solve problems using the technical means required for their survival. It capitalizes on the need humans have for expressing themselves with tools and materials. Technological literacy is considered a basic and fundamental study for all persons regardless of educational

or career goals. This area of study has replaced programs known as Industrial Arts (ITEA/CTTE, 1992, p. 1).

There are four subsystems of technology education that serve as the foundation of course content and the development of instructional strategies. These subsystems are communication, construction, manufacturing, and transportation. It is possible to vary somewhat from this framework. Some professionals felt that an acceptable structure of technology included the study of systems of communication, production (manufacturing, processing, and construction) and transportation. The ODU Technology Education curriculum follows this strategy.

Colleges and universities seeking NCATE accreditation must prepare and submit a folio for review. This folio includes three sections. Section I is an overview; Section II is a matrix; and Section III consists of appendices.

There are ten key components of the overview section of the folio. These include:

1. The program's mission statement, goals and objectives which reflect the definition of technology education as suggested by ITEA. It also describes why the technology education program exists.

2. The students' courses of studies, with a copy of the university's catalog description, and exit requirements such

as writing examinations, assessment tests or completion of the National Teachers Examination.

3. Descriptions of field experiences, student teaching and internships describing the purpose, duration, how sites were selected, how the program was monitored and how the student was evaluated.

4. Explanation of how the program may deviate from the guidelines. For example, if biotechnology was included as a major content area, the justification would be included here.

5. Description of the program's location within the educational institution; what other programs are offered through the department; the number of students and faculty in the department; and the number of each that are in the technology education program.

6. List of faculty primarily assigned to the technology education program including the department chair, full time faculty, part-time faculty, and teaching assistants.

7. Provide a list of the number of graduates who have received the bachelor's degree from the program over the last three years. Describe enrollment trends for the program.

8. A description of the program funding including appropriateness and adequacy of budgets. Provide an overview of budget trends.

9. Provide a description of how equipment and facilities have been modified to accommodate the technology education program.

10. Include a copy of the state certification requirements for technology education; indicate if and how state requirements differ from ITEA/CTTE standards.

Section II of the folio consists of a matrix with guidelines outlined on the left side of a page and the courses and/or experiences that fulfill the guidelines on the right. Table 1 is an example of this matrix.

**Table 1.**
**NCATE Accreditation Matrix**

| *Guidelines* | *Courses and/or experiences that fill the guideline* |
|---|---|
| 4.10 Promote and articulate technology education to internal and external publics. | Cite evidence of courses in which each student learns to articulate and promote the significant features of technology education to internal and external publics. |
| 4.11 Develop and coordinate an external advisory committee for the program. | Cite evidence of courses in which each student learns to develop, operate, and coordinate an external advisory committee for a technology education program. |

(CTTE, 1992, p. 11)

There are six major guideline topics included in the matrix and several sub-topics that the educational institution must respond to in terms of the courses and

experiences that meet the specified requirements. The six major guideline topics are as follows:

1. The technology education program provides a curriculum that is consistent with current research findings for curricular design.

2. Courses in math, science, and related areas in the general education component provide the necessary depth and breadth for technology education.

3. The technology education program requires appropriate academic studies in the area in which the graduate will teach. (Under this main topic there are sub-systems of instructional content in communication, construction, manufacturing and transportation.)

4. Courses/experiences are provided so that the graduate can perform tasks in developing, managing, and evaluating a technology education program in schools.

5. The professional studies component is designed to provide students with the attitudes, knowledge, and skills necessary for success as a teacher in technology education.

6. The curriculum includes a full-time student teaching experience conducted in a technology education program under the supervision of program faculty and a master teacher in the school setting.

The above guidelines are broad in nature and include the six major topic areas. For a more complete description of

these guidelines, the reader may wish to review the *NCATE-Approved Curriculum Guidelines, Basic Program in Technology Education*, which is available from the ITEA/CTTE, 1914 Association Drive, Reston, VA 22091.

Section III of the folio includes evidence to support the compliance of the technology education program and may include such items as excerpts from the university catalog, sample course syllabi, handouts or other instructional materials, and other specific information needed to substantiate responses to items in the matrix.

**Teacher Education at Darden College of Education**

**Old Dominion University**

1987 was a busy year for educators at Old Dominion University. Due to reports such as A Nation at Risk: The Imperative for Educational Reform (1983), Tomorrow's Teachers: A Report of the Holmes Group (1986), and A Nation Prepared: Teachers for the 21st Century (1986), Old Dominion University revised their teacher education programs in accordance with important findings learned from these and other related studies. Some key concepts that influenced course revision were a commitment to making the education of teachers more intellectually sound and to connect institutions of higher and professional education to

elementary and secondary schools more closely than had traditionally been the case.

The faculty believed that an effective teacher education program placed the prospective teacher at the center of instructional environments. Instead of drill and routine, ODU set out to emphasize the need to teach more abstract skills, flexible behaviors, and problem solving techniques where students are required to think rather than to simply follow directions (ODU, 1993, p. 3).

During this intense restructuring period, a new philosophy of education materialized at ODU. In summary, this philosophy supported a broad-based general education in the liberal arts and sciences where students could grow in understanding of themselves and the complex dynamics that shape the world around them. When students decide on a teaching field, they must be prepared to become life-long scholars of it. Furthermore, aspiring teachers must demonstrate a strong sense of caring about young people, be knowledgeable about current theories of human development, as well as the characteristics of the ages, learning styles, and special needs of students they hope to teach. They must be able to demonstrate this knowledge in the act of teaching, and finally, they must have a strong sense of the expectations, purposes, ends, and values of American education (ODU, 1993, p. 9).

ODU's major purpose in its education program is "to prepare professional educators who have adequate knowledge of their teaching disciplines, abilities to practice state-of-the-art instruction to students of various cultural and socioeconomic backgrounds, and attitudes which reflect commitment to teaching and learning and to life-long professional growth" (ODU, 1993, p. 9).

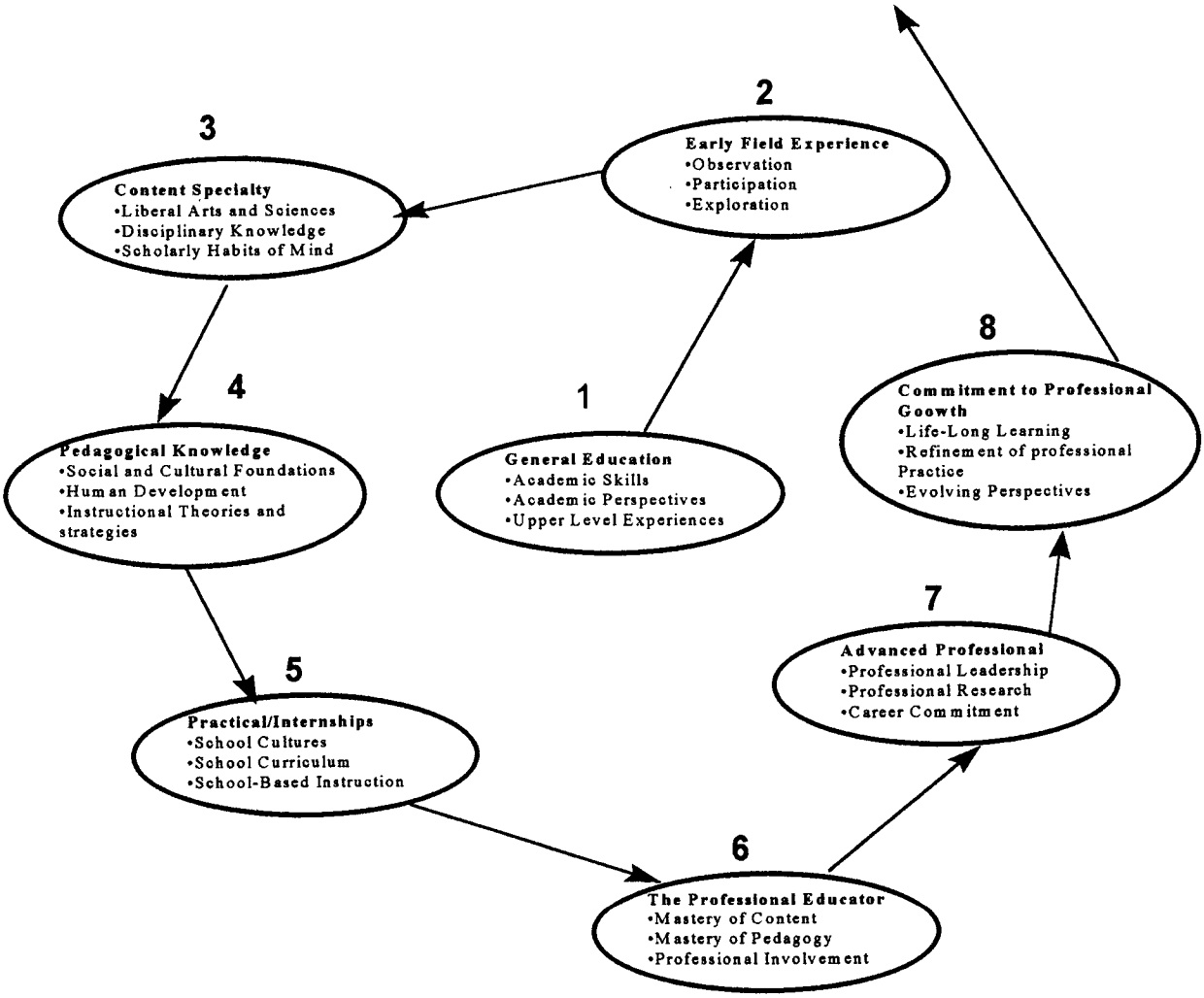
The goals of this program indicate that the student should possess a working knowledge of their teaching field(s); pedagogical knowledge of principles and strategies related to classroom organization and instructional practices; adequate knowledge of curricular content; adequate knowledge of learners' developmental characteristics and learning styles; adequate knowledge of educational contents; adequate knowledge of educational values, purposes, ends, history and philosophies which pertain to schooling in a democracy; and abilities to implement the various domains of knowledge about content, pedagogy, and schooling in a variety of educational settings (ODU, 1993, p. 10). These goals have been systematically reached through an eight step unit model as seen in Figure 1.

The general education requirement is obligatory of all undergraduate majors and includes a skills area, a perspective area, and an upper-division requirement. The skills area consists of traditional bases of academic work

**Figure 1**

**Developing Professional Educators**

**Darden College of Education**




(ODU, 1993, p. 12)

and because of the importance of the written communication skills, an exit examination in writing proficiency is required.

The perspective area introduces each student to various ways of learning and perceiving reality represented by different academic disciplines or groups of disciplines. These courses are designed to introduce the methodological processes of the discipline as much as the subject matter. There are six required courses in the areas of Fine and Performing Arts, Historical, Literary, Philosophical, Natural Science, and Social Science perspective.

The upper-division requirement of the general education studies provides some synthesizing courses that involve higher-level thinking and reinforce the development of writing skills.

The second unit is the Early Field Experience. This is an exploratory experience that allows students to observe classrooms and teachers in schools, as well as participate in some teaching activities. One of the several requirements of students is that they develop a beginning philosophy of education, based upon this early experience (ODU, 1993, p. 10).

The third unit is the Content Specialty. This is the technical knowledge of what the student will eventually be asked to teach. Students who wish to teach technology

education must complete B.S. degree requirements in those areas. This acquired knowledge better prepares the student to engage in the pedagogical studies associated with their teaching disciplines.

The fourth unit consists of Pedagogical Studies which is predicated on the investigation of relationships between teaching and learning. These relationships can be viewed as content variables, process variables, transfer variables and outcome variables.

Prospective teachers acquire knowledge and teaching skills through a variety of instructional strategies and learning opportunities. Key to this unit of instruction is providing the future teacher with the skills to be successful in the transfer of knowledge. Students learn lecture, demonstration, applicable activities, practice with feedback and collaboration techniques.

The fifth unit of study is Practice/Internships. This unit consists of a student practicum and student teaching opportunities in which students observe the operation of schools; analyze the implementation of curricula and instructional strategies; observe the growth and development of students; and assist with appropriate classroom activities. As a senior or fifth year student, the student completes a semester of student teaching. Evaluation instruments are used by both cooperating teachers and

university instructors to judge the quality of performance during student teaching.

The sixth unit occurs after the completion of program studies at the university when candidates are ready to assume entry level positions as teaching professionals. At this point, they have acquired and will continue to develop the habits and behavior that define them as educational professionals (ODU, 1993, p. 23).

The seventh unit is the Advanced Professional Studies unit and the eighth and final unit is Commitment to Professional Growth. Since these two units occur after the teacher has earned a bachelor's degree, the researcher considered these units beyond the review of pertinent literature.

## ODU's Technology Education Program

ODU offers students who wish to teach technology education the opportunity to earn a bachelor of science degree in Occupational and Technical Studies with an emphasis in teacher licensure. The curriculum for technology education was restructured in 1988 to meet state educational mandates and received NCATE accreditation approval in August, 1993. Therefore, this curriculum meets the criteria discussed in the previous sections of this chapter.

In 1989, the OTS department was appropriated $200,000 to re-equip its facility, transforming an Industrial Arts plant into a technology education facility. Old technology was removed and new equipment, including a Creative Learning Systems Technology 2000 Laboratory, as well as labs for communication, production, and energy/transportation were incorporated. This overall investment has totaled approximately $500,000.

The Technology Education Program at ODU was established for the mission of preparing Technology Education teachers for regional school systems. The curriculum is continually up-dated to stay current with trends in the profession. Graduates of the program will be prepared to teach the technological systems of communication, production, and energy/transportation at the middle or secondary level using appropriate instructional strategies.

In keeping with the Darden College of Education unit approach, the curriculum consists of a Liberal Arts and Sciences component (general education), Major or Concentration Requirements, Professional Studies Component, and Field Experience/Student Teaching Component. A complete program breakdown is featured in Table 2. Descriptions of courses are available in the 1997 ODU Catalog.

Because of the certification requirements for technology education in the state of Virginia, Old Dominion University's

**Table 2**
**Requirements for Bachelor of Science Degree**
**Occupational and Technical Studies**
***Technology Education (Teaching Certification Emphasis)***

## University General Education Requirements

| Course Number | Title | Course Number | Title |
|---|---|---|---|
| ENGL 110C | ENGLISH COMPOSITION | ENGL 112L | ENJOYING LITERATURE |
| ART 121A, | 122A, MUSC 203A, 213A, TART 185A,or 241A | HIST 131H | AMERICAN CIV IN WORLD |
| | | PHIL 110P | INTRO TO PHILOSOPHY |
| HIST 130H | AMERICAN CIV IN WORLD | GEOG 101S | ENVIRONMENTAL GEOGRAPHY |
| PSY 201S | INTRO TO PSYCHOLOGY | MATH 130M | ELEMENTARY STATISTICS |
| MATH 102M | COLLEGE ALGEBRA | PHYS 102N | ELEMENTARY PHYSICS |
| PHYS 101N | ELEMENTARY PHYSICS | HPER | (ANY ACTIVITY) |
| SPCH 101 | PUBLIC SPEAKING | ELECTIVE | OTS 382U,GEOG 305U,HIST 304U |
| OTS 370U | TECHNOLOGY AND SOCIETY | 6 HOURS | FOREIGN LANGUAGE |

## Professional course requirements (15 hours)

| Course Number | Title | Course Number | Title |
|---|---|---|---|
| ECI 412 | FUND ADOLESCENT DEV | CSSE 431 | TESTS & MEASUREMENT |
| OTED 305 | CURRICULUM FOR TECH ED | OTED 306 | METHODS FOR TECH ED |
| OTED 407 | VOC ED FOR SPEC NEEDS STU | | |

## Technical Content (39 Hours)

| Course Number | Title | Course Number | Title |
|---|---|---|---|
| | **COMMUNICATION TECHNOLOGY** | | |
| OTS 111 | DRAFTING & DESIGN | OTS 222 | COMMUNICATION DESIGN |
| OTS 250 | GRAPHIC COM PROCESSES | OTS 351 | COMMUNICATION TECHNOLOGY |
| | **PRODUCTION TECHNOLOGY** | | |
| OTS 221 | INDUSTRIAL MATERIALS | OTS 231 | MATERIALS & PROCESS TECH |
| OTS 321 | MANUFACTURING TECH | OTS 322 | CONSTRUCTION TECHNOLOGY |
| OTS 323 | PRODUCTION TECHNOLOGY | | |
| | **TRANSPORTATION TECHNOLOGY** | | |
| OTS 241 | ENERGY: BASIC ELECTRONICS | OTS 242 | ENERGY: ELECTRONIC COMMUN |
| OTS 243 | ENERGY AND POWER | OTS 360 | TRANSPORTATION SYSTEMS |
| | **TECHNICAL ELECTIVES (5-7 CREDITS)** | | |
| OTS 417 | EXP TECH & MOD INDUSTRY | OTS 386U | ARCHITECTURE |
| MET 230 | COMPUTER-AIDED DRAFTING | MET 360 | COMPUTER NUM CONTROL |
| ELECTIVE | PHYSICS (REC PHYS 106) | ELECTIVE | SAFETY (REC HE 220) |
| | **FIELD BASED EXPERIENCE (13 HOURS)** | | |
| ECI 297 | OBSERVATION & PARTICIPAT | OTED 485 | STUDENT TEACH (12 HOURS) |

(ODU, 1992, p.6)

Technology Education program uses communication, production, and transportation systems as its technological content organizers. This differs form ITEA/CTTE/NCATE guidelines in that construction and manufacturing are not included as separate content organizers. However these topics, in addition to processing, biotechnology, and automated production systems, are included in the Production Technology sequence (ODU, 1992, p. 10).

Other requirements, not depicted in Table 2, include passing the National Teacher Examination-- Praxis (General and Area Specialty), University Writing Proficiency Examination, Technology Assessment Examination, Senior Assessment Examination, and Foreign Language Requirements. Upper division electives are selected by students from an approved list of specially designated courses. Students may opt to complete a University approved minor instead of completing the upper division electives.

## Summary

This chapter provided a brief overview of the economic changes that led to the modification of traditional vocational training in our schools and reviewed the accreditation guidelines as set by the National Council for Accreditation of Teacher Education. It provided the reader with an overview of the Darden College of Education's

approach and philosophy towards the education of teachers. The review culminated with a description of ODU's requirements for the B.S. degree in Occupational and Technical Studies, teaching licensure emphasis. Chapter III describes the methods and procedures used in this research study.

# CHAPTER III

# METHODS AND PROCEDURES

This chapter is designed to describe the methods and procedures used to conduct this research study. The purpose of this study was to follow-up Old Dominion University technology education graduates to determine if they were adequately prepared to assume teaching positions. This chapter contains a description of the population, instrument design, methods of data collection, statistical analysis, and summary.

## Population

The population of this study consisted of graduates of Old Dominion University's technology education program from 1986 to 1996. During this ten year period there were 85 technology education graduates. The names and addresses of these graduates were obtained from the Office of Alumni Affairs and the Department of Occupational and Technical Studies.

## Instrument Design

Because this was a descriptive research study intended to determine attitudes, the design of the instrument was critical to both gather information and optimize the

response. The instrument consisted of open questions asking the respondents to offer their suggestions for program improvement in the major content areas, as well as closed form questions based on a Likert scale. The questions were developed with the intent to collect data from the graduates to answer the research goals of this study which were:

1. To determine if graduates of Old Dominion University's Technology Education Undergraduate Program were adequately prepared to assume teaching positions.

2. To determine whether the goals established in the college's conceptual framework were being attained.

3. To determine if these graduates are teaching traditional vocational programs or technology education.

4. To determine what improvements can be made to the undergraduate curriculum at Old Dominion University based upon graduate's feedback.

A sample of the survey instrument is included in Appendix A.

## Methods of Data Collection

To collect the data, a cover letter, the survey instrument, and a postage-paid return envelope were mailed to the selected population on May 15, 1997. The cover letter explained the purpose of the survey and why the participants' responses were crucial to the study. A sample of the cover letter is found in Appendix B.

A follow-up letter was sent on June 15, 1997 to those individuals who did not respond by that date. A sample of the follow-up letter is found in Appendix C. Another copy of the survey was also included in the with the follow-up letter.

## Statistical Analysis

The data was analyzed using percentiles and the statistical method mean. The results of the data were formatted into appropriate tables and figures to illustrate the results in accordance with the research goals of this study.

## Summary

This chapter described the methods and procedures used to conduct this study. The results of the study are presented in Chapter IV. The summary, conclusions, and recommendations are presented in Chapter V.

# CHAPTER IV

# FINDINGS

## Introduction

This chapter documents and presents the findings of the follow-up study of Old Dominion University undergraduates, who graduated from the Technology Education Program between 1986 and 1996. The problem of the study was to determine the attitudes of these program graduates to determine if they were adequately prepared to assume teaching positions. The research goals presented in Chapter I were:

1. To determine if graduates of Old Dominion University's Technology Education Undergraduate Program were adequately prepared to assume teaching positions.

2. To determine whether the goals established in the college's conceptual framework were being attained.

3. To determine if these graduates are teaching traditional vocational programs or technology education.

4. To determine what improvements can be made to the undergraduate curriculum at Old Dominion University based upon graduates' feedback.

The sections of this chapter include graduate responses to the survey, educational programs taught, preparedness to assume teaching positions, program improvement, and

attainment of the goals established in the college's conceptual framework.

## Graduate Response to the Survey

The total number of graduates from 1986 to 1996 was 85. Of these 85, a current address could not be obtained for four. The initial mailing on May 15, 1997, consisted of the survey instrument and cover letter and was sent to the 81 graduates of whom addresses could be obtained. The initial mailing resulted in 22 received. The response rate to the initial mailing was 27 percent. A follow-up letter was mailed on June 15, 1997, to the 59 non-respondents. This follow-up resulted in 19 responses received. The response rate to the follow-up was 23 percent for a combined response rate of 50 percent as indicated in Table 3.

**Table 3.**
**Percent of Graduate Response**

| Event | Number Mailed | Number of Respondents | Percent Response |
|---|---|---|---|
| Initial Mailing | 81 | 22 | 27 |
| Follow-up Mailing | 59 | 19 | 23 |
| Total Respondents | | 41 | 50 |

## Educational Programs Taught

The findings in this section were compiled from the data received in response to Question 1 of the survey instrument (Appendix A).

Question 1 was designed to determine to what degree the respondents were teaching technology education programs in schools where they were employed. As shown in Table 4, there were 17 responses in the technology education only category, 10 responses in the mostly technology education category, 5 responses in the half technology half vocational/industrial education, 4 responses in the mostly vocational/industrial category, and 1 response in the vocational/industrial education only category. The mean for this survey question was 4.03 as indicated in Table 4 showing graduates were teaching mostly technology education.

**Table 4.**
**Program Content**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Technology Education Only | 17 | 5 | 85 | |
| Mostly Technology Education | 10 | 4 | 40 | |
| Half Technology Half Vocational/Industrial | 5 | 3 | 15 | |
| Mostly Vocational/Industrial | 4 | 2 | 8 | |
| Vocational/Industrial Only | 1 | 1 | 1 | |
| Not Applicable | 4 | 0 | 0 | |
| Totals | 41 | | | 4.03 |

## Preparedness to Assume Teaching Positions

The findings presented in this section were compiled from the data in Questions 2 and 3 of the survey instrument (Appendix A).

Question 2 of the survey instrument was designed to determine the grade level of the graduate's first teaching position, middle school or high school, to provide background data to assist the researcher in answering the research goals of the study. The response to Question 2 indicated that out of the 41 respondents, 3 did not assume teaching positions, 16 respondents (42%) began their teaching career as middle school teachers, and 22 respondents (58%) as high school teachers as shown in Table 5.

**Table 5.**
**First Teaching Positions**

| Event | Middle School | High School | NA |
|---|---|---|---|
| Teaching Position | 16 | 22 | 3 |
| Percentage | 42 | 58 | |

Question 3 was designed to determine to what degree the respondent felt prepared for his or her first teaching position. The response from Question 3 indicate out of the 41 respondents, none strongly disagreed, 1 disagreed, 4 were uncertain, 24 agreed, 10 strongly agreed and 2 were not applicable. This resulted in a mean of 4.10 as shown in Table 6 which indicated that most felt prepared for their first teaching position.

**Table 6.**
**Graduates' Attitudes Towards**
**Adequacy of Preparation for First Teaching Position**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 1 | 2 | 2 | |
| Uncertain | 4 | 3 | 12 | |
| Agree | 24 | 4 | 96 | |
| Strongly Agree | 10 | 5 | 50 | |
| Not Applicable | 2 | 0 | 0 | |
| Totals | 41 | | 160 | 4.10 |

## Program Improvement

The data compiled in this section was extrapolated from Questions 4 through 7 of the survey instrument which consisted of open form questions that requested respondents' input for improvement in the major content and professional studies areas of the program.

Question 4 asked for suggestions for improvement in the Communication Technology section of the program curriculum. Twenty-one respondents offered no suggestions for improvement. The remaining twenty provided twenty-four suggestions. Those suggestions are listed below:

1. Teach Auto CAD (recent releases).
2. More up-to-date computer applications.
3. Use state-of-the-art computer hardware.
4. There should be more CAD in the OTS program.

5. It would be helpful if there were lessons and activities in both Macintosh and IBM communications programs and equipment.
6. [Teach] more CAD.
7. Teach CAD.
8. Drop the material on photography. Most school systems cover this in their art department. In its place, have more CAD work.
9. More computer lab time.
10. Emphasize producing educational materials (html, Power Point, etc.)
11. [Teach] more CAD.
12. [Teach] more computer graphics and real world programs. Use what industry is using.
13. More instruction in the use of CAD.
14. Less board drafting; 80% minimum CAD.
15. Go with CAD.
16. Emphasize CIM, CAM, CAD.
17. Include more CAD / CAM work.
18. Include more CAD into this curriculum.
19. For all areas there is a need for more computers and the software that applies to the curriculum. Schools are online with computers and ODU is dragging their feet.

20. Need CAD experience in the following areas: AUTOCAD R 12,13,14 with 3D studio; CADKEY 7.2 or newer; DRAFIX.
21. Concentrate more on computers focusing on troubleshooting and operating systems.
22. A stronger Auto CAD program [including] a requirement of one semester of straight CAD.
23. A drafting lab with CAD programs is a must if the department has not already done this.
24. Given the new technology in photography, printing, etc., (including Quick Take cameras, scanners, using a computer for all copy and layouts, etc.), I would suggest that as soon as financially feasible such equipment should be purchased and taught to students.

Question 5 of the survey instrument asked for suggestions for improvement to the Production Technology curriculum. Thirty respondents had no suggestions for improvement. The remaining eleven submitted eleven suggestions. Those suggestions are listed below:

1. You still need [to teach] some of the basics like wood-working and cabinet making because not all of the kids will go on to college. Also, some schools can't afford to change to the new technology.
2. [Include] field trips to see how these courses are applied in the world of work.

3. Make these courses more relevant to what is in the public schools now. Understand that many labs are still like those of 20 years ago (i.e. woods / metals).
4. [Include] industrial tours.
5. Produce projects that can latter be used for teaching (jigs, fixtures, etc.).
6. More plastic work; recycling work. How are plastics recycled, into what types of products.
7. Require drafting, communications and electronics before allowing entrance into this (production) course.
8. When I went through there were very few construction classes. If I had not had previous woodworking experience, I would have been seriously handicapped in my teaching jobs.
9. This is an area of great concern! I have seen recent ODU graduates that do not know how to safely use power tools. More instruction is needed in this area and less in modules.
10. Combine electronics with manufacturing to have control/logic devices.
11. More hands-on time or an internship with a local company.

Question 6 of the survey instrument asked for suggestions for improvement to the Transportation Technology portion of the curriculum. Twenty-seven respondents submitted no suggestions for improvement. The remaining fourteen offered eighteen suggestions. These suggestions are listed below.

1. [Teach] more electronics and micro-computer courses.
2. [Teach a] class on Pentium chip and other computer micro-chips.
3. Two semesters of basic electronics are needed because of the move to principles of technology.
4. Have students learn about government/corporate education programs like NASA's NEWEST/NEWMAST program or Intel's "Inside the chip".
5. Do transportation systems that are used or will be used. No $CO_2$ car. No solar or electric power. Teach overhead cam and fuel injection engines.
6. Teach computer networking systems.
7. [Include] technical writing in all courses.
8. Update the technology and have some of the actual labs that are in use at school systems.
9. Develop a course in control technology.
10. Teach more energy sources curriculum and project development.

11. Update your computer 2000 lab with the latest and greatest changes.
12. The transportation systems course could include more hands-on activities. [For example,] research a mode of transportation and report on it. Building a $CO_2$ car is not exploring the different modes of transportation.
13. Make contacts with the officials in the local and federal transportation areas. Make this a field experience (Amtrack, Southern Bell, Coal Yard etc.).
14. I would suggest more mechanical and electrical engineering concepts and applications.
15. [Include] more computer training into the curriculum.
16. My electronics courses covered a lot of theory, formulas, calculations and applications. I would recommend more hands-on training, especially given the more intricate nature of today's electronics.
17. In the area of energy and power, I would suggest more coverage in hydraulics, gears, pneumatics, etc.
18. In the area of transportation systems I would recommend more coverage of aeronautics and newer technologies such as solar energy, wind power/turbines, electric cars, meg-lev trains, etc.

Question 7 of the survey instrument requested suggestions for improvement to the Professional Requirements section of the curriculum. Seventeen respondents had no suggestions for improvement. The remaining twenty-four offered twenty-six suggestions for improvement as listed below.

1. Need to explain how to deal with politically controlled school boards, and how to discipline disruptive students.
2. Make these classes more interesting.
3. More field based experiences; more classroom time before graduating.
4. Incorporate discipline/classroom management into all sections. Provide/discuss possible management techniques in communications, transportation and production courses.
5. Tell all students they need to take two semesters of special needs material so they will be certified in special needs.
6. Increase the amount of time doing observations/ internships at the beginning of the program.
7. Cover school law.
8. Go over different structures of hierarchy in education (federal, state, local).

9. [Include] federal requirements for vocational education (that's what a lot of schools think we are).
10. More course work dealing with situations occurring in the classroom. Although nothing can prepare you for the first few days it would be nice to have a little more insight. Maybe role playing could help.
11. Mainstreaming in certain courses which include analytical thought or the use of machinery, I totally disagree with. It is dangerous, plus it causes the majority of students to receive watered-down instruction.
12. Less emphasis on writing lesson plans and more hands on instruction.
13. The education courses lacked any real situations. Include classroom management and how schools are run. Too many boring philosophies that are not relevant to the classroom today.
14. More classroom strategies for student management and discipline concerns.
15. I think there needs to be a one or two week teaching experience as part of another semester class. You don't have an idea of what your getting into until you student teach, and at that point it may be too late to change your mind.

16. Professional requirements need a shot in the arm. Everything that is written in the books is outdated. What is needed is real life experience. More visitations with schools to get field-based experience. The worst part about this curriculum is that the person teaching this section of curriculum has not been in the real world of middle school or high school in often years and things have changed drastically.
17. More instruction in classroom management and discipline.
18. More special needs related courses.
19. More mainstreaming special needs students, field-based experiences, and tech prep.
20. More and more technology teachers will encounter special needs students. There should be more special needs courses required in the curriculum.
21. More field based experiences.
22. PPST and NTE prep course.
23. Address techniques that can be used for curriculum modification concerning special education students.
24. This is the area I feel that the most improvement is needed. Some of these areas were not even covered, or were mentioned so briefly with so little relevance to what is needed in a real classroom as to be useless.

Theories in adolescent development were interesting, but more needs to be taught about classroom management and making a class real for a child: real challenging, real relevant, and real engaging. Children learn in many ways and teachers need to be shown how to meet all those learning styles. There was very little teaching provided on how to mainstream special needs students. This will affect every teacher and can make or break how effectively a class learns. This includes not only the physical limitations some children have and how to handle them in a classroom with subtlety and dignity but also children with mental and emotional challenges: the 12 year old who reads at the first grade level, A.D.D., hyperactivity, abused children, psychological problems, etc.

25. The class on tests and measures provided a lot of statistical theory but needs to be made less abstract and more relevant/practical to the teacher-to-be.
26. Given today's lawsuit prevalent society, I think that more should be included on the legal ramifications that impact the classroom, including the responsibilities and limitations of the teacher, the administrator, and the school system.

Question 8 of the survey instrument was designed to determine what professional organizations the respondents were members of. Twenty-eight of the 41 respondents, or 68 percent, indicated that they were members of a professional education organization. Several respondents indicated that they were members of several professional education organizations. There were 15 members of VTEA, 10 members of NEA, 15 members of ITEA, 1 member of CTTE, 1 member of AVA, 2 members of IEA, 16 members of TSA, 1 member of VEA, 3 members of IOTA LAMBA SIGMA, 1 member of VICA and 3 members of other educational organizations as indicated in Table 7.

**Table 7.**
**Professional Organizations**

| VTEA | NEA | ITEA | CTTE | AVA | IEA |
|---|---|---|---|---|---|
| 18 | 10 | 15 | 1 | 1 | 2 |

| TSA | VEA | IOTA LAMBA SIGMA | VICA | OTHER |
|---|---|---|---|---|
| 16 | 1 | 3 | 1 | 3 |

## Attainment of the Goals Established in the College's Conceptual Framework

The data for this section was obtained from Questions 9 through 15 of the survey instrument. These questions were

based on a Likert scale to determine the respondents' attitudes towards their perceived attainment of these goals.

Question 9 of the survey instrument was designed to determine to what degree the respondents felt that they were emerging scholars in their field. The response to Question 9 indicated that none strongly disagreed, 5 disagreed, 7 were uncertain, 18 agreed and 5 strongly agreed with the statement. There were 4 respondents that did not answer this question and the mean was 3.73 as seen in Table 8. This indicates that most graduates agreed that they were emerging scholars in their field.

**Table 8.**
**Respondents' Attitude Toward Being an Emerging Scholar**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 5 | 2 | 10 | |
| Uncertain | 7 | 3 | 21 | |
| Agree | 18 | 4 | 72 | |
| Strongly Agree | 7 | 5 | 35 | |
| Not Applicable | 4 | 0 | 0 | |
| Totals | 41 | | 138 | 3.73 |

Question 10 was designed to determine to what degree respondents believed that they had acquired a beginning philosophy and theoretical background that enabled them to articulate their belief systems. Thirty-seven of the forty-one respondents answered this survey question. No one strongly disagreed, 2 disagreed, 4 were uncertain, 20 agreed

and 13 strongly agreed with the statement. The mean was 4.64 as presented in Table 9. This indicated that graduates strongly agreed that they had acquired a philosophy and theoretical background which enabled them to articulate their belief system related to education.

**Table 9.**
**Philosophy and Belief Systems**

| | Number of Responses | Point Value | Total Points | Median |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 2 | 2 | 4 | |
| Uncertain | 4 | 3 | 12 | |
| Agree | 20 | 4 | 80 | |
| Strongly Agree | 13 | 5 | 65 | |
| Not Applicable | 2 | 0 | 0 | |
| Totals | 41 | | 181 | 4.64 |

Question 11 was designed to determine to what degree the respondents learned to translate human development theory into practice. There were thirty-seven responses to this question out of the forty-one surveys that were returned. No one strongly disagreed, 2 disagreed, 3 were uncertain, 25 agreed, and 7 strongly agreed with the statement. The mean was 4.0 as presented in Table 10. This showed that graduates agreed that they could translate human development theory into practice.

**Table 10.**
**Human Development Theory**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 2 | 2 | 4 | |
| Uncertain | 3 | 3 | 9 | |
| Agree | 25 | 4 | 100 | |
| Strongly Agree | 7 | 5 | 35 | |
| Not Applicable | 4 | 0 | 0 | |
| Totals | 41 | | 148 | 4.0 |

Question 12 was designed to determine to what degree the respondents acquired a sense of the methodologies employed by teachers and researchers on teaching. Of the 41 surveys that were returned, there were 37 responses to this statement. There were no responses in the strongly disagree category, 4 in the disagree category, 3 were uncertain, 21 agreed, 9 strongly agreed with the statement and 4 gave no response (not applicable). The mean was calculated to be 3.95 as indicated in Table 11. This indicated that graduates agreed that they had acquired a sense of the methodologies employed by technology teachers and researchers.

**Table 11.**
**Methodologies**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 4 | 2 | 8 | |
| Uncertain | 3 | 3 | 9 | |
| Agree | 21 | 4 | 84 | |
| Strongly Agree | 9 | 5 | 45 | |
| Not Applicable | 4 | 0 | 0 | |
| Totals | 41 | | 146 | 3.95 |

Question 13 was designed to determine to what degree the respondents have become aware of and involved in the uses of resources available to a beginning teacher in terms of people, materials, technology, places and professional organizations of teachers. No one strongly disagreed and no one disagreed with the survey statement. There were 2 responses in the uncertain category, 21 in the agree category and fifteen in the strongly agree category. Three respondents did not answer the question and the mean was calculated to be 4.34 as presented in Table 12. This indicated that graduates agreed that they know how to obtain and use resources appropriate to instruction in technology education.

**Table 12.**
**Available Resources**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 0 | 2 | 0 | |
| Uncertain | 2 | 3 | 6 | |
| Agree | 21 | 4 | 84 | |
| Strongly Agree | 15 | 5 | 75 | |
| Not Applicable | 3 | 0 | 0 | |
| Totals | 41 | | 165 | 4.34 |

Question 14 was designed to determine to what degree the respondents have practiced the art and science of professional decision-making, problem-solving, and classroom management processes in their field. Of the 41 responses, 3

did not answer this question. Of the 38 whom responded to this survey question, no one strongly disagreed, no one disagreed, 1 was uncertain, 18 agreed, and 19 strongly agreed with the statement indicating a mean of 4.53 as indicated in Table 13. This indicated that graduates strongly agreed that they were prepared to make decisions, solve problems and manage classrooms.

**Table 13.**
**Professional Decision-making, Problem Solving and Classroom Management**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 0 | 2 | 0 | |
| Uncertain | 1 | 3 | 3 | |
| Agree | 16 | 4 | 64 | |
| Strongly Agree | 21 | 5 | 105 | |
| Not Applicable | 3 | 0 | 0 | |
| Totals | 41 | | 172 | 4.53 |

Question 15 was designed to determine to what degree the respondents have acquired attitudes that will enable them to join and become a contributing member of a community of other professional educators. Three respondents did not answer this survey question. Of the remaining 38 respondents, no one strongly disagreed, no one disagreed, 1 was uncertain, 18 agreed, and 19 strongly agreed with the statement. The mean was 4.47 as indicated in Table 14. This indicated the

graduates agreed they were prepared to join others in the professional community of educators.

**Table 14.**
**Attitudes that will Contribute to the Community of Professional Educators**

| | Number of Responses | Point Value | Total Points | Mean |
|---|---|---|---|---|
| Strongly Disagree | 0 | 1 | 0 | |
| Disagree | 0 | 2 | 0 | |
| Uncertain | 1 | 3 | 3 | |
| Agree | 18 | 4 | 72 | |
| Strongly Agree | 19 | 5 | 95 | |
| Not Applicable | 3 | 0 | 0 | |
| Totals | 41 | | 170 | 4.47 |

## Summary

In this chapter the responses to the follow-up survey were reported. The research objectives were re-stated, and the data were reported in accordance with the research objectives. Chapter V will provide a summary, conclusions based on the findings in Chapter IV, and provide recommendations for further study.

# CHAPTER V

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Summary

The problem of this study was to determine the attitudes of Old Dominion University undergraduates, who graduated from the Technology Education Program between 1986 and 1996, to ascertain if they were adequately prepared to assume teaching positions. The research goals as presented in this study were:

1. To determine if graduates of Old Dominion University's Technology Education Undergraduate Program were adequately prepared to assume teaching positions.

2. To determine whether the goals established in the college's conceptual framework were being attained.

3. To determine if these graduates are teaching traditional vocational programs or technology education.

4. To determine what improvements can be made to the undergraduate curriculum at Old Dominion University based upon graduate's feedback.

There was no record of a formal follow-up study of Technology Education program graduates to solicit feedback that could be used for improvement of the Technology Education program at Old Dominion University.

No descriptive research study is one-hundred percent accurate unless the entire population responds to the survey, understands the intent of the survey instrument and answers the questions honestly. In addition to the response rate of the survey, the following limitations were recognized to have an effect on this study:

1. The study was limited to graduates of Old Dominion University's Technology Education program.

2. The study was limited to data collected through a survey.

3. The study was limited to graduates from 1986 to 1996.

The population of this study consisted of graduates of Old Dominion University's technology education program from 1986 to 1996. During this ten year period there were 85 technology education graduates. A valid mailing address could not be obtained for four graduates, therefore the sample population was reduced to 81 graduates. Data were collected from the graduates by constructing a survey that included open and closed form questions to solicit responses toward fulfilling the research goals. The survey instrument and a cover letter that explained the purpose of this study were mailed to the sample population via the U.S. mail. A follow-up letter and another survey instrument were mailed to non-respondents approximately four weeks after the initial

mailing to again request their participation to the survey. Slightly over fifty percent of the sample population responded to the survey. Percentiles and means were used to tabulate and analyze and data.

## Conclusions

The conclusions of this study were formulated based on the findings of the survey as presented in Chapter IV and are addressed in the order of the research goals.

1. Were the graduates of Old Dominion University's Technology Education Undergraduate Program adequately prepared to assume teaching positions? It was concluded that the graduates of Old Dominion University's Technology Education Program were adequately prepared to assume teaching positions. This conclusion was formulated based upon the responses to Question 3 of the survey instrument which requested the respondents to indicate to what degree their technical and instructional studies at ODU were adequate to prepare them for their first teaching position. On a Likert scale, the mean was 4.10 which indicated that the respondents agreed with this statement.

2. Were the goals as established in the college's conceptual framework being attained? It was concluded that all the college's conceptual goals, as outlined in the "Qualities of the Professional Educator" section of the

National Council for Accreditation of Teacher Education's Institutional Report, Volume I, Standards for the Unit, were being attained. This conclusion was reached based on the data extrapolated from Questions 8 through 15 of the survey instrument. The response to Question 8 indicated that 68% of the graduates were members of one or more professional education organizations. Questions 9 through 15 requested that the graduates respond, based upon a Likert scale, to their perceived attainment of the goals established in the college's conceptual framework. The mean for Questions 9 through 15 was 3.73, 4.64, 4.00, 3.95, 4.34, 4.53, and 4.47, respectively, for a combined mean of 4.24. Therefore, it was concluded that the respondents attained these goals.

3. Are these graduates teaching technology education or traditional vocational programs? It was concluded that the respondents were teaching mostly Technology Education. This conclusion was formulated from the data collected from Questions 1 and 2 of the survey instrument. Question 1 was based on a Likert scale and requested the graduates to circle the number that best described the content of the program in which they teach. The possible responses were Technology Education only, mostly Technology Education, half Technology and half Vocational/Industrial Education, mostly Vocational/Industrial Education and Vocational/Industrial Education only. The point value for Technology Education only

was 5 and the point value for Vocational/Industrial Education only was 1. The mean was 4.03 which indicated that the respondents were teaching mostly Technology Education. The response to Question 2 of the survey instrument indicated that 42 percent of the respondents taught middle school and 58 percent taught high school.

4. What were the recommendations of the graduates for Technology Education program improvement? Even though the respondents were satisfied that they were adequately prepared for their first teaching position, they offered several suggestions for improvement in the three major content areas and the professional requirements section of the curriculum.

The suggestions for improvement in the Communications Technology portion of the curriculum included a strong response to incorporate Auto CAD into the curriculum. Other suggestions consisted of increasing the emphasis in computer technology and computer applications, including more IBM and Macintosh lessons and activities, dropping the traditional photography curriculum and restructure it with a computer based program, and to increase the emphasis on trouble shooting computers and operating systems.

The suggestions for improvement to the Production courses section of the curriculum included continuing instruction in power tools, wood-working and cabinet making activities, incorporate field-based experiences in order to

understand how these courses are applied in industry, produce products that the prospective teacher can use in the classroom, include more emphasis on recycled materials, and combine electronics with manufacturing to incorporate control/logic devices.

As for suggestions for improvement to the Transportation curriculum, the respondents suggested more emphasis on electronics to include hands-on activities, developing and implementing a course in control technology, learning about government/corporate education programs, deleting $CO_2$ car building and replacing it with more applicable transportation activities, teaching computer networking systems, more emphasis on hydraulics, gears and pneumatics, and alternative energy transportation activities.

Suggestions for improvement to the Professional requirements segment of the curriculum primarily dealt with increasing the emphasis on classroom management techniques, discipline strategies, special education requirements, and more field-based classroom experiences. Also recommended were including more instruction on school law, how to deal with politically controlled school boards, and replacing the tests and measures class with a more relevant and practical course for future teachers.

## Recommendations

Based on the findings and the conclusions of this study, the following recommendations were made:

1. The Old Dominion University Technology Education curriculum should include increased emphasis in Computer-Aided Drafting. At this writing, the OTS department has the hardware and is working to implement CAD into its curriculum. CAD was available as a technical elective in MET 230.

2. The Old Dominion University Technology Education curriculum should incorporate more field based experiences including a practicum in which the prospective teacher spends time in a public school classroom in order to experience the challenges in the field he/she hopes to teach. This practicum should be incorporated early in the students' college experience. Much of this requirement is covered in ECI 297-- Observation and Participation, and OTED 485— Student Teaching.

3. The Old Dominion University Technology Education curriculum should include increased emphasis in classroom management and classroom discipline to embody strategies and field-based experiences. This is a course that could replace Tests and Measures since this content is also covered in OTED 305, Curriculum for Technology Education.

4. The Old Dominion University Technology Education curriculum should include increased emphasis on basic

electricity and electronics in the form of practical applications and hands-on experiences to bolster students understanding of the theory, formulas, calculations and applications of electronics.

5. The Old Dominion Technology Education program should include increased emphasis on computers in terms of operating systems, software applications indicative to the technology education field, networking and troubleshooting. Much of this is currently covered in OTS 351, Communication Technology.

6. The Old Dominion University Technology Education program should include increased emphasis in special needs students and school law including field-based experiences in which the prospective teacher can observe special needs students in a real technology education environment. This should be incorporated into OTED 407, Vocational Education for Special Needs Students.

7. The Old Dominion University Technology Education Transportation curriculum should consider dropping $CO_2$ car projects from their Transportation program and incorporate a more applicable subject such as alternative energy vehicles, and activities for the various transportation systems.

8. Follow-up studies of Technology Education program graduates should be conducted every five years to ensure timely and accurate feedback.

## Bibliography

Alkin, Marvin C. (1992) Encyclopedia of Educational Research, Sixth Edition. New York, NY: McMillian Publishing Co., Inc. Volume: 4. Pp.1389-1390.

Barella, R., & Wright, T., (1981). *An interpretative history of industrial arts: The interrelationship of society, education, and industrial arts.* ACIATE Yearbook. Bloomington, IL. McKnight Publishing Co., Inc.

Carneval, Anthony P. (1991). Skills for the New World Order. The American School Board Journal. Pp. 1-3.

Council on Technology Teacher Education (CTTE). (1992). The Preparation of Curriculum Folios in Technology Education. Reston, VA: CTTE/ITEA. Pp. 1-14.

International Technology Education Association (ITEA). (1985). *Technology Education: A perspective on implementation.* Reston, VA.

International Technology Education Association/Council on Technology Teacher Education. (1992) NCATE Approved Curriculum Guides. Reston, VA: ITEA/CTTE. P. 1.

Old Dominion University. (1992). A Folio Review for the National Council for Accreditation of Teacher Education. Norfolk, VA: Darden College of Education Old Dominion University. Pp. 1-10.

Old Dominion University. (1993). National Council for Accreditation of Teacher Education Institutional Report. Norfolk, VA: Darden College of Education Old Dominion University. Pp. 1-24.

Old Dominion University. (1986). University Catalog Issue 1989-90, Announcements 1985-86. Norfolk, VA: Old Dominion University. Volume: LIV. Number: 1. P. 87.

Old Dominion University. (1989). University Catalog Issue 1989-90, Announcements 1990-92. Norfolk, VA: Old Dominion University. Volume: LVII. Number: 1. P. 89.

Zais, Robert S. (1976). Curriculum Principles and Foundations. New York, NY: Thomas Y. Cromwell Co., Inc. Pp. 389-390.

**APPENDICIES**

# APPENDIX A

## Sample of the Survey Questionnaire

## APPENDIX A

This study is being conducted as a follow-up of graduates of the Old Dominion University's Technology Education program. The information collected through this study will be used for program assessment and improvement to better serve future students and employers.

Name_____ Year of Graduation_____

1. Please circle the number that best describes the content of the program in which you teach.

1. Technology Education only.
2. Mostly Technology Education but some Vocational Skills Training and/or Industrial Arts.
3. Nearly half Vocational Skills Training and/or Industrial Arts and half Technology Education.
4. Mostly Vocational Skills Training and/or Industrial Arts and some Technology Education.
5. Vocational Skills Training and/or Industrial Arts only.

2. What was the grade level of your first teaching position after graduation from ODU?

☐ Middle School (grades 6th through 8th)

☐ High School (grades 9th through 12th)

3. Your technical and instructional studies at ODU were adequate to prepare you for your first teaching position. Please circle the number that best describes your experience.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

4. What are your suggestions for improvement in the Communication Technology section of the curriculum? (This includes: courses in drafting, graphic communications processes, communication design, and communication technology).

5. What are your suggestions for improvement in the Production Courses section of the curriculum? (This includes: industrial materials, materials & processes, manufacturing, construction and production).

6. What are your suggestions for improvement in the Transportation Technology section of the curriculum? (This includes: courses in energy [basic electronics], energy and power, energy [electronic communications], and transportation systems).

7. What are your suggestions for improvement in the Professional Requirements section of the curriculum? (This includes: courses in adolescent development, tests and measures, curriculum for technology education, mainstreaming special needs students, field-based experiences, etc.).

8. Please indicate what professional organizations you are members of (VTEA, NEA, ITEA, CTTE, TSA, AVA, etc.).

Please circle the number that best describes you as a professional educator.

9. I see myself as an emerging scholar in my field.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

10. I have acquired a beginning philosophy and a theoretical background that enables me to articulate my belief systems.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

11. I have learned to translate human development theory into practice.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

12. I have acquired a sense of the methodologies employed by scholars in my academic field, as well as methodologies employed by teachers and researchers on teaching.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

13. I have become aware of and involved in the uses of resources available to me as a beginning teacher—such as people, materials, technology, places and professional organizations of teachers.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

14. I have practiced the art and science of professional decision-making, problem-solving, and classroom management processes in my field.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

15. I have acquired a set of attitudes that will enable me to join and become a contributing member of a community of other professional educators.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |

Thank you for participating in this important follow-up study.

# APPENDIX B

## Sample of the Initial Cover Letter

**APPENDIX B**

(Date)

Dear _____,

As an Old Dominion University Occupational and Technical Studies graduate, we are seeking your assistance in a follow-up survey of our former Technology Education students. This survey collects valuable information that can be used for program improvement.

Your name is asked so that we can follow-up with non-respondents to improve our sample size. However, your responses will be kept anonymous.

Only you have the information we need to provide the department with the tools it needs to improve the technology education program. Your candid response to the survey is vital to its success. With the results, we will be able to determine possible changes that can be made to the undergraduate program that would better prepare prospective technology teachers for entry to the workforce.

Please respond and return the enclosed survey in the self-addressed envelope provided. If you have any questions regarding the survey, please feel free to call me at work (757) 363-4616 at home (757) 481-3825 or e-mail mark.siciliano@mci2000.com.

Sincerely,

Mark D. Siciliano

# APPENDIX C

## Sample of follow-up Letter

**APPENDIX C**

August 8, 1997

Dear _____:

Recently I mailed you a survey and requested your participation in a follow-up survey of Old Dominion University technology education graduates. As of today's date I have not yet received your response.

**Since you are the only one with the information I need, your response is important to me and the success of the study.**

If you have ever been employed as a vocational or technology education teacher, your feed-back and experience will surely assist Old Dominion University to better prepare its students to meet the challenges of today's classroom.

If you have never been employed as a teacher, would you please indicate that on the survey and place it in the mail. This will improve our response rate to the study.

Sincerely,

Mark D. Siciliano