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A Follow-up Study of Old Dominion University Bachelors of Science Graduates of the Technology Program 1997-2001

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A Follow-up Study of Old Dominion University

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by

Pei-wen Lo

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SIGNATURE PAGE

This research paper was prepared by Pei-wen Lo under the direction of Dr. John Ritz in OTED 636, Problems in Occupational and Technical Education. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Masters of Science.

Approval By: _____   7-23-02

Dr. John Ritz   Date
Advisor and Graduate Program Director

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--- Pei-wen Lo ---

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CHAPTER I

INTRODUCTION

Technology education has been evolving over the past three decades, since the study of technology has been increasingly affecting both human work and society. The increased importance of knowing, understanding, using, and applying technology in our daily life has caused the technology education profession to redesign its programs from the materials and processes associated with its former title - industrial arts. Professionals and their associations are providing the direction to build consensus for the curriculum for the study of technology.

During the 1990's, there was an increasing push to make technology education one of the core academic subjects. The profession tried to position itself as a recognized subject along with English, science, social studies and mathematics in grades K-12. The International Technology Education Association conducted funded research for a six-year period that resulted in the publication of *Standards for Technology Literacy: Content for the Study of Technology* (ITEA, 2000). It described the standards and benchmarks to outline the content for technological literacy, grades K-12. If these standards are followed they should enable K-12 students to become familiar with the basic knowledge and applications of technology. As this new information is studied and integrated into the curriculum, technology education will become a vital component of a contemporary education.

As a technology educator in the 21st century, the mission is to put an emphasis on developing students' ability of using technology to solve problems, preparing them to be critical thinkers and productive citizens. Basically, technology educators have a responsibility to enable students to live a successful life in a technological world. As society develops, there is a need to adapt to a changing society. Students of the future must be able to understand technology that has developed over history and realize both the positive and negative effects it has on them as individuals and also their surrounding societies and environments. Technology plays a necessary role in education for our information-based age. It is a central subject to understand, know, and apply through school curricula to ensure students can succeed in the future.

In 1998, the Council on Technology Teacher Education identified Old Dominion University's Technology Education program as an outstanding program. However, as described above, the technology education profession is under continual change. With the *Standards for Technological Literacy* being released, Old Dominion University must change its curriculum to enable its graduates to continue to become first class teachers. Therefore, the Old Dominion Program must collect data from its graduates to determine if they feel that they have been prepared for their teaching assignments. It is our responsibility to keep the technology education program at Old Dominion University continually updated with a curriculum that prepares graduates to be fully qualified teachers.

Statement of the Problem

The problem of this study was to determine the attitudes of Old Dominion University technology education graduates, who graduated from 1997-2001, whether they were effectively prepared to assume teaching positions.

Research Goals

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

1. To determine whether graduates of Old Dominion University's Technology Education undergraduate program were adequately prepared to assume teaching positions.

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

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

Background and Significance

The follow-up study is one of the effective approaches to evaluate and improve the school's program based on the feedback from the post-graduates. Also, many institutions and educational programs have evaluations every five years in order to maintain their accreditation; the school program should have follow-up studies as self-evaluations to keep the program making progress to meet the needs of the dramatically changing society and community and world, especially in this 21st century. The importance of having graduates evaluate the

curriculum of their program is to determine whether the program had continually provided graduates with necessary skills, knowledge and dispositions enabling them to compete in their teaching field. The second follow-up study of technology education graduates from Old Dominion University was conducted by Mark D. Siciliano in 1997, therefore, the collected data of this follow-up study would increase the possibility to know if the technology education program at Old Dominion continually offered an adequate curricula within the past five years, 1997-2001, and assist the faculty to diagnosis the weakness and strengthens of the current program curriculum.

Limitation

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

1. The study was limited to graduates of the teacher preparation program at Old Dominion University.

2. The study was limited to B.S. graduates from 1997-2001.

3. The study was limited to graduates in the technology education program.

Assumptions

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

1. Old Dominion University's technology education program adequately prepared graduates to teach technology education in public school systems.

2. Old Dominion University graduates lack the skills for teaching the traditional form of technology education, industrial arts.

3. It was assumed that all graduates truthfully answered the questions on the survey.

4. Graduates need to better understand how to integrate the *Standards for Technological Literacy* into their daily instruction.

Procedures

A survey was sent to all graduates, 1997-2001. The survey consisted of a number of questions attempting to answer the previously stated research questions. The plan of this study was to send out surveys to the graduates who completed the program from 1997-2001. The mailing will include a cover letter and stamped return envelope. Graduates' names and addresses were obtained from the Alumni Affairs Office at Old Dominion University. The data on this survey will indicate whether the technology education program at Old Dominion University needs to be restructured to make necessary curriculum improvements and to better prepare future graduates.

Definition of Terms

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

1. Technology education: A study of technology, which provides an opportunity for students to learn about the processes and knowledge

related to technology that are needed to solve problems and external human capabilities (ITEA, 2000, p. 242).

2. Technology education program: The curriculum followed by a university student to obtain a degree in technology education.

3. Technological literacy: The ability to use, manage, understand, and assess technology (ITEA, 2000, p. 9)

4. Vocational Education: Training within an educational institution that is intended to prepare an individual for a particular career or job (ITEA, 2000, p. 242). Today it is referred to as career and technical education.

Summary and Overview

Chapter I contained the introduction to technology education in the current society of this 21st century and the technology education program at Old Dominion University. The study was a descriptive study designed to determine graduates' attitudes toward the effectiveness of the technology education program curriculum at Old Dominion University. In addition to the above, the research provided the reason why this study was needed and where the problem took place and the procedures of finding out the answer to the study of the problem.

Chapter II consists of the review of relevant literature on technology teacher education. Chapter III offers the explanation of the methods and procedures employed to collect and analyze data. Chapter IV is a summary of

the findings obtained from the survey. Chapter V summarizes the study and develops conclusions and makes recommendations for future study.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to inform the reader of background information related to this study. This chapter has been divided into three sections. The first section is the overview of the standards for the preparation of technology teachers. The second section will describe the National Council for Accreditation of Teacher Education. The third section will provide an overview of the present technology education program at Old Dominion University.

Moving into the 21st century, a technology-based age, technology has changed our society a lot, from the way we teach in the classroom and to the way we communicate, manufacture, transport, and construct. In addition, the business community is expecting schools to graduate students who are productive workers and problem solvers and decision makers in the workplace. Those trends result in a call for the reformation of the preparation of technology teachers and the content of the curriculum in the technology education program. This chapter will examine issues to clarify the direction where technology education is headed at this current time and how the National Council on Accreditation of Teacher Education and Council on Technology Teacher Education are making efforts to provide practical standards for the specialty units and programs to ensure their qualities of preparing perspective teachers. Efforts are also needed to reduce the gap

between the theory learned in university courses and practice in the classroom. Furthermore, the research will examine the changes in the technology education program at Old Dominion University to address students' preparation for the teaching profession.

The Standard For Technology Teacher Preparation

There is a strong correlation between students' achievement and teachers' knowledge, quality and experience. This is why it is so important for professional educators to use *Standard of Technological Literacy* in teacher preparation. Teachers have continuously implemented technologies in the classroom to help students to learn of new technological developments before they graduate from high school. Some studies have shown technologies do have their own unique characteristics to inspire students' interests of learning and to improve students' achievement. Therefore, seeking information on how to incorporate technology into the teacher education programs to enable new teachers to be prepared to teach in tomorrow's classroom is a main issue for professional technology educators.

The Council on Technology Teacher Education/International Technology Education Association/National Council on Accreditation of Teacher Education NCATE document provided standards for the preparation of technology teachers. Following is a description of the draft of the program standards set for the technology teacher profession (2000, CTTE, pp. 1-10):

Standard 1: Nature of Technology- Technology education teacher candidates develop an understanding of the nature of technology. The program prepares technology education teacher candidates who can:

(1) identify the characteristics of technology and explain the scope of technology, (2) compare the relationship among technologies, (3) make connections between technology and other disciplines, and (4) evaluate the core concepts of technology.

Standard 2: Technology and Society- Technology education teacher candidates should develop an understanding of technology and society. The program prepares technology education teacher candidates who can:

(1) compare the relationships between technology and social, cultural, political, and economic systems, (2) assess the role of society in the development and use of technology, (3) assess the importance of significant technological innovations on the history of human kind, (4) judge the effects of technology on the environment, and (5) be able to evaluate the relationship between technology and social institutions such as family, religion, education, government and workforce.

Standard 3: Design- Technology education teacher candidates develop an understanding of design. The program prepares technology education teacher candidates who can:

(1) explain the importance of design in the human-made world, (2) contrast the attributes of design, (3) assess the engineering design processes and principles, and (4) be able to apply the processes of trouble-shooting, research and

development, invention and innovation, and experimentation in developing a solution to a design problem.

Standard 4: Abilities for the Technological World- Technology education teacher candidates develop abilities for a technological world. The program prepares technology education teacher candidates who can:

(1) select design problems, including establishing criteria and constraints of the problem, (2) evaluate a design, assessing the success of a design solution and develop proposals for design improvements, (3) analyze an item, and identify the key components of how it works, and how it was made, (4) operate and maintain technological products and systems, (5) develop and model a design solution, (6) complete an assessment to evaluate merits of a design solution, (7) operate a technological device or system, (8) diagnose a malfunctioning system, restore the system, and maintain the system, and (9) investigate the impacts of products and systems on individuals, the environment, and society.

Standard 5: The Designed World- Technology education teacher candidates develop an understanding of the designed world. The program prepares technology education teacher candidates who can:

(1) identify various medical technologies as part of the designed world, (2) compare various agricultural and related biotechnologies as part of the designed world, (3) analyze the principles, concepts and applications of energy and power technologies, (4) describe the principles, concepts and applications of information and communication technologies, (5) analyze various transportation technologies that are a part of the designed world, (6) illustrate

the principles, concepts and applications of construction technologies, and (7) select and use appropriate technologies in a variety of contexts including medical, agricultural and related biotechnologies, energy and power applications, information and communications, transportation, manufacturing, and construction.

Standard 6- Curriculum- Technology education teacher candidates design, implement, and evaluate curricula based upon standards for technological literacy. The program prepares technology education teacher candidates who can: (1) integrate technological content with other fields of study, (2) identify curriculum and instructional materials that enable effective delivery when teaching about technology, (3) engage in long-term planning that results in an articulated curriculum based on Standards for Technology Literacy for Grades K-12, (4) design a technology curriculum that integrates content from other fields of study, (5) improve a technology curriculum by making informed decisions using multiple sources of information, (6) incorporate up-to-date technological developments into the technology curriculum, and (7) implement a technology curriculum that systemically expands the technological capabilities of the student.

Standard 7: Instructional Strategies- Technology education teacher candidates use a variety of effective teaching practices that enhance and extend learning of technology. The program prepares technology education teacher candidates who can:

(1) base instruction on a contemporary teaching strategy that is consistent with *Standards for Technological Literacy*, (2) apply the principles of learning and consideration of student differences to the delivery of instruction, (3) select and use a variety of instructional strategies to maximize student learning about technology, (4) apply appropriate materials, tools, equipment and processes to enhance student learning about technology, and (5) analyze instructional strategies to improve teaching and learning in the technology classroom by using self-reflection, student learning outcomes, and other assessment techniques.

Standard 8: Learning Environment- Technology education teacher candidates design, create, and manage learning environments that promote technological literacy. The program prepares technology education teacher candidates who can: (1) create a rich learning environment that provides for varied educational experiences in the technology classroom, (2) identify a learning environment that encourages, motivates, and supports student learning, innovation, design, and risk taking, (3) design a learning environment that establishes student behavioral expectations that support an effective teaching and learning environment, and (4) create a flexible learning environment that is adaptable for the future.

Standard 9: Professional Growth- Technology education teacher candidates understand and value the importance of engaging in comprehensive and sustained professional growth to improve the teaching of technology. The program prepares technology education teacher candidates who can:

(1) demonstrate an informed background about the knowledge base and processes of technology, (2) continuously build upon effective instructional practices that promote technological literacy, (3) apply various marketing principles and concepts to promote technology education and the study of technology, and (4) collaborate with other candidates and professional colleagues to promote professional growth (2000, CTTE, pp. 1-10).

The guidelines for technology education teacher preparation have been reviewed in the previous paragraphs in order to inform the reader of the new standards for technology teacher preparation. However, there is another consideration in how teacher preparation should be seen as a continuing process. Educators should never stop learning about the new knowledge in their specific study area; therefore, educators need to update themselves and consistently grow through their professional and program development.

As the Committee on Science and Mathematics Teacher Preparation (CSMTP) has formulated, six guiding principles should be emphasized in teacher education preparation programs in science, mathematics and technology (2000, CSMTP, p. 7). They include:

1. The improvement of teacher education and teaching in science, mathematics, and technology should be viewed as a top national priority.

2. Teacher education in science, mathematics, and technology must become a career-long process. High-quality professional development programs that include intellectual growth as well as the upgrading of teachers'

knowledge and skills must be expected and essential features in the careers of all teachers.

3. Through changes in the rewards for, incentives for, and expectations of teachers, teaching as a profession must be upgraded in status and stature to the level of other professions.

4. Both individually and collectively, two- and four-year colleges and universities must assume greater responsibility and be held more accountable for improving teacher education.

5. Neither higher education nor the K-12 communities can successfully improve teacher education as effectively in isolation as they can by working closely together. Collective, fully integrated efforts among school staff and administrators in individual schools and districts, teacher unions, faculty and administrators in institutions of higher education, policymakers from local colleges and universities, parents, and the private sector are essential for addressing these issues.

6. Many more scientists, mathematicians, and engineers must become well informed to become involved with local and national efforts to provide the appropriate content knowledge and pedagogy of their disciplines to current and future teachers.

The National Council on Accreditation of Teacher Education

NCATE is the profession's mechanism to establish the standards for teacher preparation to ensure the highest quality of teachers. NCATE accredited

programs have been seen as approved. Graduates from accredited programs know subject matters and the most successful way to teach these, and the programs meet the teaching professional standards, and the programs have been reviewed by professionals (NCATE, 1999, p. 11).

The National Council for Accreditation of Teacher Education has changed its program review procedures based on inputs-based standard to performance-based standard in accreditation beginning in 2000. The members of the Specialty Areas Studies Board (SASB) are responsible for writing guidelines for specialty organization standards and reviewing these procedures (NCATE, 2000, p. 2). There are four guidelines of performance-based assessment systems that should be met by specialty programs or units in order to maintain the status of accreditation. The assessment systems should (NCATE, 2000, p. 18):

(1) address the knowledge, skills, and dispositions to be acquired by professional educator candidates as set forth in program goals.

(2) be consistent with the standards of relevant national and state accrediting/approval bodies.

(3) have multiple means for measuring candidate performance and impact.

(4) provide on-going, systematic information useful for decision-making.

NCATE established the timeline for units to implement the assessment systems and specialty units should be sure that they will provide the candidate proficiency data to meet the timeline as found in Table 1 (2000, NCATE, p. 4).

Table 1. The Timeline of Implementing the Assessment Systems

Academic Year	2001-2002	2002-2003	2003-2004	2004-2005
Assessment Plan	Well-developed Plan	Early implementation	Implementation and refinement	Full implementation
Assessment Data	Currently available data (e.g., performance on admission assessments, on state licensure test, in student teaching and internships)	Currently available data plus data being collected from pilot assessments being conducted within the unit/program	Currently available data plus data being collected from pilot assessments being conducted within the unit/program	Results of both external and internal performance assessments
Implementation of assessment plan		Pilot testing of assessments	Pilot testing and refining of assessments	Fully implemented

The Present Technology Education Program at Old Dominion University

The technology education program at Old Dominion University has met NCATE's program standards, and it is recognized as an accredited program. The curriculum of the Technology Education Program at Old Dominion University had been redesigned in 1988 in order to meet the demands of the state department of education and the program was first accredited in August, 1993 (NCATE, 1999, p. 528).

As an accredited program, the curriculum of the technology education program at Old Dominion University must have considered several components provided by NCATE. These are presented as follows (1999, NCATE, pp. 7-8):

(1) Does the curriculum require that prospective teachers gain a broad based liberal arts knowledge base?

(2) How does the college or university ensure that the teacher knows the content he or she has chosen to teach?

(3) If the candidate plans to teach elementary school, the prospective teachers should thoroughly master the professional and content knowledge and know how to teach mathematics, reading, science, social studies, etc.

(4) The programs of study use the subject matter standards developed by professional associations.

(5) The programs of study attend to diversity in the curriculum and provide multicultural and global perspectives.

(6) Are perspective teachers prepared to use technology as a teaching tool by the end of their program of study?

(7) Does the program provide opportunities for perspective teachers to gain knowledge of methods for teaching special needs learners?

The technology education program at Old Dominion University is a 120-hour program which leads to teacher licensure (ODU, 2000, p. 137). Tables 2-4 provide a list of the courses that are included in the program.

Table 2. General Education Requirements

Title	Credits
Written Communication	6
Oral Communication	3
Mathematics (MATH 102 M and STAT 130 M required)	6
Foreign Language	6
Computer Skills (OTS 251 D)	3
Fine and Performing Arts	3
History	3
Literature	3
Philosophy	3
Natural Science and Technology (PHYS 101 N,	11

102 N and OTS 370T Technology and Society required)

Table 3. Technical Content

Title	Credits
OTS 111 Drafting and Design	3
OTS 222 Communication Design	3
OTS 250 Graphic Communication Processes	3
OTS 351 Communication Technology	3
OTS 221 Industrial Materials	3

Title	Credits
OTS 231 Materials and Processes Technology	3
OTS 321 Manufacturing Technology	3
OTS 322 Construction Technology	3
OTS 323 Production Technology	3
OTS 241 Energy Systems: Basic Electricity	3
OTS 242 Energy Systems: Electronic Communication	3
OTS 243 Energy and Power	3
OTS 360 Transportation Technology	3
OTS 417 Exploring Technology and Modern Industry	3

Table 4. Technology Education Teaching Courses

Title	Credits
ESSE 413 Fundamentals of Human Growth and Development	3
OTED 297 Observation and Participation	1
OTED 305 Curriculum for Technology Education	3
OTED 306 Methods for Technology Education	3
OTED 408 Advanced Classroom Issues and Practices	3
OTED 485 Student Teaching	12
OTS 450 Assessment, Evaluation and Improvement	3

OTED 297 is an opportunity that has been offered to all perspective teachers to participate and observe in real world classrooms. The purpose of

this course is to give students a better picture of how their specific field has been taught. All the students have to pass the PRAXIS I exam to enroll in OTED 408, advanced classroom issues and practices, and to enroll in student teaching, OTED 485.

Summary

This chapter informed readers of the changes in teacher preparation in technology education according to the new program review requirements of National Council on Accreditation of Teacher Education. Also it examined the basis for teacher preparation in the technology education program. Furthermore it provided the course requirements for the Bachelor of Science Degree for the technology education program at Old Dominion University. Chapter III will provide on overview of the methods and procedures applied in collecting data for this research paper.

CHAPTER III

METHODS AND PROCEDURES

This chapter contains the methods and procedures that were used within this study. The purpose of this study was to determine if graduates from the technology education program at Old Dominion University were prepared to assume their teaching positions in public school. This chapter discussed the population, instrument design, methods of data collection, statistical analysis and summary.

Population

The population of this study included graduates of the technology education program at Old Dominion University from 1997 through 2001. The Occupational and Technical Studies Department and the Office of Alumni Affairs offered the names and addresses of these graduates. The population included graduates from the undergraduate program. The population was 54.

Instrument Design

This was a descriptive study, which was designed to determine the attitudes of graduates toward the teaching preparation they received from the technology education program at Old Dominion University. A survey was used as an instrument for obtaining data and the questions of the survey answered the research goals of this study. These included:

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

The survey consisted of open and closed form questions. The closed form questions used a Likert scale format. In this format strongly disagree (SD) represented a value of 1, disagree (D) had a value of 2, Uncertain (U) had a value of 3, Agree (A) had a value of 4 and strongly agree (SA) had a value of 5. It was developed using the 1997 study conducted by Mark Siciliano as a guide. A sample of the survey instrument is included in Appendix A.

Methods of Data Collection

Each survey included a cover letter, which was used to encourage the respondent to assist the department and explained the purpose of the survey. A stamped return envelope was included. A sample of the cover letter is included in Appendix B. Also follow-up letters were sent with another copy of the survey to those who did not respond after 10 days of receiving the first letter. A sample of the follow-up letter is included in Appendix C.

Statistical Analysis

The data were presented by percentile and the statistical method of median. Tables were used to present the result of the data.

Summary

This chapter provided the information on the methods and procedures used to conduct this study to seek answers of the research goals. The findings of this study will be offered and analyzed in Chapter IV. The findings could be used as references to provide direction for improving the present and future technology education programs at Old Dominion University.

CHAPTER IV

FINDINGS

The purpose of this chapter was to present the findings obtained from the technology education graduates. The problem of the study was to determine the attitudes of Old Dominion University technology education graduates, who graduated from 1977-2001, and whether they were effectively prepared to assume teaching positions. The research goals of the study were:

1. To determine whether graduates of Old Dominion University's Technology Education undergraduate program were adequately prepared to assume teaching positions.

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

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

Response Obtained from the Survey

The survey was sent to 46 program graduates from 1997- 2001. Eight graduates were not contacted because addresses could not be located. The initial mailing was sent on June 6, 2002, and seven respondents filled out and returned the survey. The response rate of the initial mailing was 15 percent. A follow-up letter was mailed to the 39 graduates who did not respond to the initial mailing on June 20, 2002. Sixteen of those surveys were sent back giving a total response rate of 50%.

Employment Information and Preparation for First Teaching Position

Question 1, 2 and 3 were designed to seek an answer to research goal one, whether graduates of Old Dominion University's Technology Education undergraduate program were adequately prepared to assume teaching positions. The responses of Question 1 indicated 19 graduates are currently or have been employed as an educator since graduation and the other four responses indicated they are not currently or have not been employed as an educator since graduation.

Question 2 was designed to determine the grade level of graduates' first teaching position after graduation from Old Dominion University. The responses from Question 2 indicated 14 out of 23 respondents attained a teaching position at the high school level as their first teaching position and of the other nine respondents, five of them were teaching at middle school as their first teaching job after graduating from Old Dominion University. The other four were not teaching either at high school or at middle school. The above information was shown in Table 5.

Table 5.
First Teaching Position

Event	Middle School	High School	Others
Teaching Position	5	14	4
Percentage	21%	60%	19%

Question 3 was designed to determine if graduates feel they were adequately prepared to attain their first teaching position in the technology

education. The responses of Question 3 were showed in Table 6. Twelve out of 23 respondents strongly agree and of the other 11, 10 of those respondents agreed and the other one was uncertain. The median of the data was 5 as showed in Table 6 that indicated graduates strongly felt they were prepared for their first teaching position.

Table 6.
The Preparation for Teacher Education

	Number of responses
Strongly Disagree	0
Disagree	0
Uncertain	1
Agree	10
Strongly Agree	12
Not Applicable	0
Median	5

Suggestions for the Program Curriculum

Questions 4 to 8 were designed as opened questions which asked graduates to give some suggestions on program improvement. The responses to these questions assisted the researcher to acquire the answers to research goal two, what improvements can be made to the undergraduate curriculum at Old Dominion University based upon graduate's feedback. Question 4 asked graduates to explain the reason why their responses were strongly agree, agree, uncertain, disagree or strongly disagree to Question 3. Ten respondents with an agree answer to Question 3 provided reasons and suggestions on Question 4 as following:

1. Two graduates suggested that more emphasis needs to be placed on training future teacher on all areas of teaching including classroom management and evaluations and what their school expects from them and how to teach today's student.

2. One graduates suggested that the program should offer a course to teach a future teacher how to handle the classroom conflict generated by the students or the dynamics of administrators vs. teaching staff.

3. Three graduates suggested that the program should put more emphasis on curriculum development and classroom management information.

4. Two graduates suggested that up-to-date computer knowledge and skills such as computer networking and CAD software be added to the curriculum.

5. Two graduates suggested that the program should let students begin student teaching earlier.

The other 12 respondents strongly agreed and those graduates gave some compliment on the program. These included:

1. Four graduates felt they were prepared since the courses in the program coved a broad area and give a lot of information on what technology is and how it is represented and how to keep up with technology trends.

2. Three graduates felt the program taught them how to present information using the most appropriate methods in order to get them ready to teach.

3. Three graduates felt the program exposed them to various topics, hand-on activities and provided a relaxed atmosphere so they were prepared for their first teaching position.

4. Two graduates felt the classes and practical experience were a good way to prepare future teachers.

Question 5 to Question 8 asked graduates to make suggestions on the improvement of the program curriculum. Question 5 asked feedback on how to improve the Communication Technology curriculum including drafting, graphic communication processes, communication design, and communication technology. Eight of twenty-three responses were returned with no suggestions and the other 15 respondents made some suggestions on program improvement. The suggestions were listed as follows:

1. One graduate indicated that the program should let students know what type of equipment and materials the state uses since equipment and materials were not standardized.

2. Two graduates suggested that the facilities at ODU need to be upgraded in order to let future teachers know how to operate them at the ODU classrooms.

3. One graduate suggested the program should teach various CAD programs available in communities with an emphasis on all auto DESK products such as Auto CAD 2000 , MECHANICIAL DESKTOP, Inventor and 3D V12 or 3D MAX.

4. Seven graduates suggested that the program should add teaching CAD programs.

5. One graduates suggested the program should prepare a future teacher for how to teach technology content as a technology education teacher, not as a technology education student.

6. One graduate suggested that the program should teach some more content on Architecture and Engineering and method to use in the Computer Lab.

7. Two graduates suggested that the program should offer a course to have an introduction to Internet research and having guest speakers as a class activity.

Question 6 was designed to ask graduates to offer some suggestions on improving the Production Technology curriculum. Twelve out of twenty-three responses of this question were returned with no suggestions. The other 11 respondents made some suggestions on the Production Technology curriculum as listed below:

1. Four graduates suggested that the program needs to emphasize more on classroom management and lab safety for the Production Technology curriculum.

2. Two graduates suggested that the lab at ODU should be upgraded and the program should encourage future teachers to develop lessons for middle and high school students.

3. One graduate suggested placing more emphasis on microprocessor and robotic programming.

4. One graduate suggested providing more instruction in welding.

5. One graduate suggested having guest speakers as a class activity.

6. One graduate suggested providing more team building skills.

7. One graduate suggested adding emphasis on production systems, quality control and safety.

Question 7 asked graduates to make suggestions on the Transportation Technology section of the curriculum. Fourteen of twenty-three respondents returned this question with no suggestions. The other nine respondents made some suggestions on improving the Transportation Technology curriculum. The suggestions were listed as following:

1. One graduate suggested that pre-requisites of energy systems should be defined more clear so those taking it will be able to get the Principles of Technology endorsement.

2. One graduate suggested that the program needs to emphasize how to make projects fun and where to collect ideas for projects.

3. Two graduates suggested that the program needs to improve the coverage of principles of technology.

4. One graduate suggested more intense electronics study and stressing the importance of those classes.

5. Two graduates suggested that the program should add emphasis and assignment of regular faculty and should plan a school trip to local transportation technology programs so students can see or experience them in action.

6.   One graduate suggested that the program should provide some safety courses.

Question 8 was designed to let graduates make some suggestions for improving the Professional Requirements section of the curriculum. Eleven of twenty-three respondents returned the survey with no suggestions. The other 12 made suggestions on the curriculum. The suggestions were listed as follows:

1.   One graduate suggested that the curriculum needs to be divided into middle and high school levels.

2.   Two graduates suggested that the program needs to teach future teachers how to handle the conflict among students and among other teachers and between teachers and administrators.

3.   One graduate suggested that the program should send OTS 297 students to their specific career field, not to any course within a school.

4.   One graduate suggested that the program needs to emphasize how to develop lessons to engage students learning.

5.   Three graduates suggested that the classes need to teach future teachers what should be included in curriculum and lesson plans.

6.   Two suggested that the program needs to put more emphasis on class management.

7.   Two graduates suggested that the textbook needs to be replaced and the program needs to add material about the teacher certification process.

Question 9 asked if graduates are members of professional organizations such as VTEA, NEA, ITEA, TSA, ACTE, etc. The responses indicated that 14 out of 23

respondents are members of professional organizations and some of those respondents are members of more than one professional organization. There were 7 members of VTEA, 4 member of NEA, 7 members of ITEA, 7 members of TSA, 1 member of ACTE, 1 member of WEA, 1 member of VEA, and 1 member of PTA. Eight members did not join any professional organizations.

Table 7.
Members of Professional Organizations

VTEA	NEA	ITEA	TSA	ACTE	None
7	4	7	7	1	8
WEA	VEA	PTA	Others		
1	1	1	2		

The Findings of the Goals Established in the College's Conceptual

Framework

Questions 10-15 were designed to answer research goal three, whether the goals established in the college's conceptual framework were being attained. Question 10 was designed to determine if graduates have been taught how to demonstrate knowledge and skills to provide learning opportunities supporting students' intellectual, social, and personal development. Eight out of twenty-three respondents indicated the response strongly agree. Ten respondents agreed and the other four were uncertain and one strongly disagreed. The median of this data was 4 which indicated most of graduates felt they were prepared with the necessary knowledge and skills needed to develop students' various abilities in the school classroom. The twenty-three respondents were listed in Table 8.

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Table 8.
Knowledge and Skills

	Number of responses
Strongly Disagree	1
Disagree	0
Uncertain	4
Agree	10
Strongly Agree	8
Not Applicable	0
Median	4

Question 11 was designed to seek an answer if graduates are capable of creating learning environments that encourage positive social interactions, active engagement in learning, and self-motivation. The responses to the question indicated that eleven respondents strongly agreed, eight respondents agreed, two respondents were uncertain, and one respondent disagreed. The median of data was 4 which indicated that most of graduates' attitudes toward their ability of acquiring the capability to create learning environments were positive. The responses were analyzed in the Table 9.

Table 9.
Positive Learning Environments

	Number of responses
Strongly Disagree	1
Disagree	1
Uncertain	2
Agree	8
Strongly Agree	11
Not Applicable	0
Median	4

Question 12 was designed to seek an answer to the question if graduates are able to be decision makers, problem solvers, and continually practice classroom management processes in his or her field. Twelve of twenty-three respondents strongly agreed, seven respondents agreed, two were uncertain, one disagreed, and one strongly disagreed. The median of this data was 5 which represented most graduates' attitudes toward being a decision maker, problem solver and practiced classroom management. The responses were shown in Table 10.

Table 10.
Decision Maker, Problem Solver and Classroom Management

	Number of responses
Strongly Disagree	1
Disagree	1
Uncertain	2
Agree	7
Strongly Agree	12
Not Applicable	0
Median	5

Question 13 was designed to seek an answer to the question, if graduates have developed and demonstrated proficiencies in working with students from diverse backgrounds and with exceptionalities. The responses to this question indicated that 10 respondents strongly agreed, eight respondents agreed, two respondents disagreed, two were uncertain, and one strongly disagreed. The median for this data was 4, which indicated most gradates agreed they were proficient in working with students with diversity backgrounds. The data were analyzed in Table 11.

Table 11.
Proficiencies in Working with Diverse Backgrounds

	Number of responses
Strongly Disagree	1
Disagree	2
Uncertain	2
Agree	8
Strongly Agree	10
Not Applicable	0
Media	4

Question 14 was designed to determine if graduates have developed the proficiency necessary to begin or continue a career as teacher or other school professional. Thirteen respondents to this question strongly agreed and six respondents of this question agreed, two respondents were uncertain, one disagreed, and one strongly disagreed. The median of data was 5 which indicated most graduates strongly agreed that they have the necessary competence to start or continue a career as teacher or other school professional. The responses were analyzed as follows in Table 12.

Table 12.
Professional Development

	Number of responses
Strongly Disagree	0
Disagree	1
Uncertain	2
Agree	5
Strongly Agree	13
Not Applicable	0
Median	5

Question 15 was designed to seek an answer to the question, if graduates are aware of using available resources to teach at schools. Eight respondents of this question strongly agreed, 10 respondents agreed, one disagreed, two were uncertain, one respondent did not answer the question and one strongly disagreed. The median of this data was 4, which means most of graduates agreed they were aware of and involved in using available resources. The responses were analyzed in Table 13.

Table 13.
Available Resources

	Number of responses
Strongly Disagree	0
Disagree	1
Uncertain	2
Agree	9
Strongly Agree	8
Not Applicable	1
Median	4

Question 16 asked graduates if they have acquired a set of attitudes that will enable them to join and become a contributing member of a community of other professional educators. Ten respondents of this question strongly agreed, 9 respondents agreed, one respondent disagreed, one was uncertain, one respondent did not answer the question, and one strongly disagreed. The median of this data was 4, which means graduates felt they have obtained the attitudes that will enable them to join and become a contributing member of a

community of other professional educators. The responses were analyzed in Table 14.

Table 14.
Attitude that Will Contribute to the Community of Professionals

	Number of responses
Strongly Disagree	1
Disagree	1
Uncertain	1
Agree	9
Strongly Agree	10
Not Applicable	1
Median	4

Summary

This chapter presented the responses to the survey which contained 16 opened and closed form questions. The responses to the survey were analyzed by percentile and the statistical method of median in order to determine if the research goals were achieved. The following chapter, Chapter V, will provide information on the summary and conclusions based on the results of this study and provide recommendations for the present and future technology education program at Old Dominion University.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The problem of this study was to determine the attitudes of Old Dominion University technology education graduates, who graduated from 1997-2001, whether they were effectively prepared to assume teaching positions. The research goals established for this study were:

1. To determine whether graduates of Old Dominion University's Technology Education undergraduate program were adequately prepared to assume teaching positions.

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

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

The follow-up study is an approach to evaluate if the program had offered graduates appropriate knowledge and necessary skills and preparation needed to be successful in the teaching field. The findings of the study would assist the program faculty to detect if there are changes needed to be made to keep the curriculum up to date and to meet the needs of the changing society. Furthermore, the study can lead the program faculty to notice weaknesses and strengthens of the current program curriculum.

No study is 100 percent correct unless the whole population responds to the survey and answers the questions sincerely and takes the intention of the

study seriously. There are still other factors affecting the process of collecting data. Therefore, this study had three such limitations which were:

1. The study was limited to graduates of the teacher preparation program at Old Dominion University.

2. The study was limited to B.S. graduates from 1997-2001.

3. The study was limited to graduates in the technology education program.

The population of this study was focused on the graduates from 1997-2001 in the technology education program at Old Dominion University. A survey was constructed as a tool for obtaining data which attempted to answer the research goals of the study. The initial mailing was sent with a cover letter which explained the purpose of the survey and the importance of graduates participation to the survey. The survey included sixteen closed and opened form questions. A follow-up letter was sent to those who did not respond after 10 days of receiving the first letter. The data and findings were analyzed by percentile and median.

Conclusions

The conclusions of this study were developed based on the findings of the survey. The following are the conclusions to each research goal.

Goal 1 was to determine whether graduates of Old Dominion University's Technology Education undergraduate program were adequately prepared to assume teaching positions. The findings indicated that the graduates of Old Dominion University's Technology Education were adequately prepared to

assume teaching positions. This conclusion was made based on the responses to Question 1, which asked if graduates currently or have been employed as an educator since graduation and Question 3 which asked if graduates felt they were fully prepared for a teaching position. Respondents indicated in Question 1 that 81 percent were teaching. The median for the Question 3 was 5 which indicated graduates strongly agreed to the statement that they felt prepared for their initial teaching position.

Goal 2 was to determine what improvements could be made to the undergraduate curriculum at Old Dominion University based upon graduate's feedback. The graduates provided suggestions for improving the program curriculum through their responses to Question 5 through Question 8. For the communication technology section, graduates suggested that the program needed to add upgraded content such as Auto CAD 2000, MECHANICIAL DESKTOP, Inventor, and 3D Visual 12 or 3D MAX. Also the equipment and facilities in the laboratory needed to be upgraded. Furthermore, the curriculum should add some emphasis on the subjects of such as architecture and engineering and methods of teaching in a computer lab.

For the Production Technology section, the conclusions were made based on Question 6 which asked graduates to make suggestions to improve the production technology courses. The suggestions included adding more emphasis on industrial safety, classroom management, production systems, quality control, team skills, and providing more instruction in the area of welding.

For the Transportation Technology section, the conclusions were made based on Question 7 which asked graduates to make suggestions to improve the transportation technology courses. The suggestions included additional knowledge on principles of technology and electronic. They also suggested planning a school trip to a local transportation technology lab and to define the requirements to qualify for teaching principles of technology.

For the professional requirements section, the conclusions were made based on Question 8 which asked graduates to make suggestions on the professional education courses. The suggestions included teaching a future teacher how to deal with conflicts at school and to teach a future teacher what to teach at the school settings while emphasizing how to engage the learner. Also a graduate suggested that the professional courses should be divided into middle and high school levels.

Goal 3 was to determine if the goals established in the college's conceptual framework were being attained. This conclusion was made based on the responses of Questions 9 to 16. The response of Question 9 indicated that 62 % of the graduates were members of one or more professional organizations. The median to Questions 10 to 16 were either 4 or 5 on a Likert scale which indicated that graduates agreed or strongly agreed that the technology education program at Old Dominion University meets the goals established in the college's conceptual framework. These included: (1) emerging scholars of their teaching or educational support specialty, (2) philosophers and theoreticians about education, (3) life-long, inquiring learners, (4) effective

practitioners, (5) resource seekers, (6) educational decision-makers and problem-solves, and (7) members of a professional community.

Recommendations

The following recommendations were made based on the findings and conclusions of this study. The recommendations are as following:

1. The Old Dominion University technology education program should provide more instruction on class management and classroom safety.

2. The Old Dominion University technology education program should upgrade its classroom equipment in order to ensure future teachers will be able to use the equipment found in different school settings.

3. The Old Dominion University technology education program should add an Auto CAD program to the curriculum in order to keep future teachers current with communication technology.

4. The Old Dominion University technology education program should revise its curriculum to incorporate *Standards for Technological Literacy*.

5. The Old Dominion University technology education program should continue to conduct follow-up studies to gather alumni attitudes for the continued improvement of its program.

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APPENDICES

APPENDIX A. Sample of the Survey Questionnaire

APPENDIX B. Sample of the Cover Letter

APPENDIX C. Sample of Follow-up Letter

APPENDIX A

Sample of Survey Questionnaire

A Survey of Old Dominion University Technology Education Graduates 1997-2001

Code Number:

Directions: This survey contains opened questions where you need to write your own answers and closed questions where you need to circle the number from those that have been provided.

__Please do not write your name on this survey.__

Part I:

1. Are you currently or have you been employed as an educator since graduation? If your answer is no, please go directly to Question 3.

    1. Yes

    2. No

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

    1. Middle School (grades 6th through 8th).

    2. High School (grades 9th through 12th).

3. Do you feel you were adequately prepared in the technology education program at Old Dominion University for your first teaching position. Please circle the number that best describes your feelings.

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

4. According to your answer to Question number 3, please explain the reason.

5. What are your suggestions on improving the **Communication Technology** section of the curriculum? (The courses included drafting, graphic communication, processes, communication design, and communication technology).

6. What are your suggestions on improving the **Production Technology** section of the curriculum? (The courses included industrial materials, materials and processes, manufacturing, construction and production system).

7. Please make suggestions for improving the **Transportation Technology** section of the curriculum? (The courses included energy system I [basic electronics] energy and power, energy system II [electronic communications], and transportation systems).

8. What are your suggestions on improving the **Professional Requirements** section of the curriculum? (The courses included methods for technology education, curriculum for technology education, instruction for technology education, advanced classroom issues and practices, assessment, evaluation and improvement, field-based experiences, etc.).

9. Please indicate what professional organizations you are members of (VTEA, NEA, ITEA, TSA, ACTE, etc.).

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

10. I have learned to demonstrate knowledge and skills to provide learning opportunities supporting students' intellectual, social, and personal development.

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

11. I have acquired abilities to create learning environments that encourage positive social interaction, active engagement in learning and self-motivation.

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

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

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

13. I have developed and demonstrated proficiencies for working with students from diverse backgrounds and with exceptionalities.

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

14. I have developed the competence necessary to begin or continue a career as teacher or other school professional.

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

15. I have become aware of and involved in the uses of resources available to me such as people, materials, technology, places and professional organizations for teachers.

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

16. 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 your participation and spending your valuable time on filling out this survey. We really appreciate it.

APPENDIX B

Sample of the Cover Letter

June 5, 2002

Mr. Roger Raymond Lagesse
3 Sterling Court
Hampton VA 23669

Dear Mr. Lagesse:

The Department of Occupational and Technical Studies at Old Dominion University is looking forward to your participation and assistance. We are conducting a follow-up study of technology education alumni; you may or may not know that Old Dominion University is only one of five programs in the nation to be recognized as an outstanding program by the Council on Technology Teacher Education. This study will help us to determine if you were properly prepared for your current teaching position.

Your data will provide us with valuable information which will assist us in determining if there is a need to make changes in our technology education program. You are one who can help us to determine the weaknesses and strengths of our curriculum at Old Dominion University. In the long term, all alumni comments will guide us to effectively and correctly prepare prospective teachers in the future.

Your data will remain anonymous and only summary data will be reported. I hope you can spend some time on filling out this survey for us.

Please return this survey in the self-addressed stamped envelope. If you have any questions regarding the survey, please feel free to e-mail me at peiwenpc@msn.com or call at 757-489-2278.

Sincerely,

Pei-wen Lo   John M. Ritz
Graduate Assistant   Professor and Chair

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Enclosure: Questionnaire

APPENDIX C

Sample of follow-up Letter

June 15, 2002

Mr. Austin P. Mantay
1305 W. 42nd Street
Norfolk, VA 23508

Dear Mr. Mantay:

Recently you received a survey and were asked for you to participate in our research study, a follow-up survey of Old Dominion University technology education graduates.   However, we have not received your response at this time. Because your response is the most important resource of the improvement of the technology education program, the study would not be possible without your participation.

If you have not completed and returned the survey, please take a few minutes to do this now. Otherwise, if you have already returned the survey, I would like to thank you for your participation and help.

Sincerely,

Pei-wen Lo   John M. Ritz
Graduate Assistant   Professor and Chair

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Enclosure: Questionnaire