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A Comparison of the Final Grades of Campus-based Students and Distance Learning Students taking the Common Core Courses in the Occupational and Technical Studies Curriculum

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**A COMPARISON OF THE FINAL GRADES OF
CAMPUS-BASED STUDENTS AND DISTANCE LEARNING STUDENTS
TAKING THE COMMON CORE COURSES IN THE OCCUPATIONAL AND
TECHNICAL STUDIES CURRICULUM**

A Research Project Presented to the Graduate Faculty of the
Department of Occupational and Technical Studies,
Old Dominion University

In Partial Fulfillment of the Requirements for the
Masters of Science in Occupational and Technical Studies

By
David J. Sorey
July 2002

SIGNATURE PAGE

David James Sorey prepared this research project under the direction of Dr. John M. Ritz in OTED 636, Problems in Occupational and Technical Studies. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the degree of Master of Science in Occupational and Technical Studies.

Approved by: John M. Ritz

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CHAPTER I

INTRODUCTION

As a result of continuous advances in technology, distance education has revolutionized the processes associated with teaching and learning. Televised instruction began appearing in the late 1940s and early 1950s at such institutions as the University of Michigan and American University (Zigarell, 1991). Distance education programs experienced noticeable growth in the 1990s and continued to thrive in the world of higher education. During the 1997-98 academic year, one-third of all two-year and four-year colleges and universities were offering distance-learning courses (Lewis, Snow, Farris, & Levin, 1999). Lewis et al. (1999, p. 2) define distance education as “education or training courses delivered to remote (off-campus) location(s) via audio, video (live or prerecorded), or computer technologies, including both synchronous and asynchronous instruction.”

Recognizing the need to expand its offerings to place-bound Virginia residents, Old Dominion University established TELETECHNET, an interactive distance learning education program. Beginning in 1994 as a means for students to obtain baccalaureate degrees, Old Dominion University later expanded to offer graduate degree programs to its students at over 50 distant sites throughout the Commonwealth and across the nation. Through technology, Old Dominion University offers individuals educational opportunities that they would not have otherwise.

This study was undertaken to determine if there is a difference between the academic success of students completing coursework on campus as compared to those who take the courses from a distance.

STATEMENT OF THE PROBLEM

The purpose of this study was to compare grades received by students taking the common core courses in the Occupational and Technical Studies curriculum via Old Dominion University's TELETECHNET Distance Learning program with those students taking the same core courses in a traditional campus-based classroom setting, in order to determine if one learning environment is more effective than the other.

RESEARCH HYPOTHESIS

To find a solution to this problem, the following hypothesis was established:

H₀: There will be no significant differences in grades between Occupational and Technical Studies common core courses taken via Old Dominion University's TELETECHNET Distance Learning program and campus-based classes as determined by grades earned by participating students.

BACKGROUND AND SIGNIFICANCE

Although there are many significant educational opportunities available for students as a result of technology, concerns still exist regarding the quality of education that distance-learning students receive. Distance learning programs are often considered to be "second-class versions of on-campus learning programs" (Sherron & Boettcher,

1997, p. 2). This perception, often held by distance-learning students themselves, “may have its roots in the belief...that much peripheral learning and acculturation happen during the course of on-campus experiences that are not part of the explicit course activities, goals and objectives” (Sherron & Boettcher, 1997, p. 3).

Through Old Dominion University’s TELETECHNET program individuals can conveniently “attend” classes despite being many miles from campus. However, are these students receiving the same quality of education as those students on campus? Potential hazards, or what some would consider disadvantages, do indeed exist. Therefore, by comparing the final grades of all the students this researcher was able to determine whether or not campus-based students enjoyed a more advantageous learning environment over their distant counterparts, or vice versa.

LIMITATIONS

The limitations of this study were as follows:

1. This study was limited to the final grades of all students registered in the Occupational and Technical Studies common core graduate courses: OTED-785, Curriculum Development in Occupational Education and Training; OTED-788, Instructional Strategies and Innovations in Training and Occupational Education; OTED-789, Instructional Technology for Education and Training; and OTED-635, Research Methods in Occupational and Technical Studies.
2. This study compared the final grades of all students enrolled in TELETECHNET and campus-based courses from the spring of 1996 to the summer of 2001.

3. This study was limited to students enrolled at Old Dominion University taking courses on campus in Norfolk, Virginia, as well as at distance sites located throughout the United States.

4. This study did not consider what effect, if any, previous experience taking distance-learning courses would have on the final grades received.

ASSUMPTIONS

In the study there were several factors that were assumed to be true and correct.

Those assumptions were as follows:

1. All students taking the common core courses were degree seeking.
2. All students enrolled in the common core courses were in the Occupational and Technical Studies graduate program.
3. Course requirements for TELETECHNET and campus-based classes were the same.
4. Students in both TELETECHNET and on-campus classes were graded equally, based on course requirements and participation.
5. The same course materials, instruction, assignments, and methods of evaluation were used in classes on the same topics.
6. The efforts and abilities of each individual student were not the same.
7. All students enrolled in the Occupational and Technical Studies common core courses were seeking a Master of Sciences degree.
8. All students registered in the Occupational and Technical Studies common core courses had fulfilled all admission and continuance requirements.

9. The common core courses were taught by a variety of instructors with varying personalities and teaching styles.
10. Faculty members taught both campus-based courses and distance learning courses.

PROCEDURES

This experimental study compared the final grades of students taking the Occupational and Technical Studies common core courses, OTED-635, OTED-785, OTED-788, and OTED-789, on campus and at various sites of Old Dominion University's distance learning program. On-campus and TELETECHNET student's final grades were collected from each semester between the spring of 1996 and summer of 2001. Once all the data were collected, the final grades of the two groups of students were compared to determine if there was a difference between the grades earned by campus-based students and distance learning students.

DEFINITION OF TERMS

With regards to this study, the following terms are defined for clarification purposes:

Campus-based class- a traditional classroom environment where the instructor and all of the students participating in the course are located in the same room. (Classes offered at the regional centers would fall in the category as well).

Common core courses- *Classes that all students seeking a Master of Science degree in Occupational and Technical Studies must complete and are considered to be foundation courses. These courses include OTED-635, OTED-785, OTED-788, and OTED-789.*

Degree-seeking student- a student who has applied and met admission requirements for a specific college and is actively pursuing a Master of Sciences degree at Old Dominion University.

Distance Learning- Lewis, L., Snow, K., Farris E., and Levin, D. (1999, p. 2) “define distance learning as education or training courses delivered to remote (off-campus) location(s) via audio, video (live or prerecorded), or computer technologies, including both synchronous and asynchronous instruction.”

Occupational and Technical Studies (OTS)-As described in the Old Dominion University Catalog (2000-2002), “this department offers this graduate degree with three concentrations. These include community college teaching, middle/secondary education teaching, and business and industry training. These studies are designed to help teachers and trainers upgrade their knowledge and skills and prepare for leadership roles in education and training” (p. 140).

OTED-635, Research Methods in Occupational and Technical Studies- As described in the Old Dominion University Catalog (2000-2002), “a course that teaches types of research, selection of problems, location of educational information, collection and classification of data, organization, presentation, and interpretation of materials. The focus is on conducting research in the student’s content specialty area” (p. 281).

OTED-785, Curriculum Development in Occupational Education and Training- As described in the Old Dominion University Catalog (2000-2002), “a course designed to prepare students to design and develop curriculum for occupational education and training courses and programs. Included is a focus on articulation between secondary and community college and workforce needs” (p. 281).

OTED-788, Instructional Strategies and Innovations in Training and Occupational

Education- As described in the Old Dominion University Catalog (2000-2002), “learning and teaching styles are considered as a basis for developing instructional strategies to maximize occupational and technical education at all levels, including secondary, the community college, and senior institutions. Relevant learning theories and knowledge of self, learner, and the environment are blended to enhance the participant’s instructional strategies” (p. 281).

OTED-789, Instructional Technology for Education and Training- As described in the Old Dominion University Catalog (2000-2002), “a course that teaches the application of electronic media to the instructional process. Topics include computer applications, interactive video, videotaping, computer projection, and visual aid production”(p. 281).

TELETECHNET- The researcher used the definition found in the Old Dominion University Catalog (2000-2002). “It is defined as a program that delivers graduate and upper-division undergraduate courses to place-bound students throughout the Commonwealth, as well as across the country through an integrated system of video, computer and audio signals” (p. 8).

SUMMARY AND OVERVIEW OF CHAPTERS

This study sought to determine if there is a difference between the final grades of students taking the Occupational and Technical Studies common core courses, OTED-635, OTED-785, OTED-788, and OTED-789, via Old Dominion University’s TELETECHNET distance learning program and students taking the same course in a traditional on-campus classroom setting. Chapter I of this study introduced the reader to

the problem area, identified the limitations and assumptions that must be acknowledged when considering the study and discussed the methods for retrieving the necessary data that was analyzed. Specific terms and abbreviations were also defined for clarity.

The following chapters of this study will include a review of literature relating to distance education. A methodology will also be provided describing how data was collected and what procedures were used in order to analyze the data. A summary of the findings, conclusions and recommendations for future research studies will also be provided.

CHAPTER II

REVIEW OF LITERATURE

The goal of this study was to collect and analyze data comparing the final grades of students taking the same courses at distant locations versus those taking them locally on campus. Prior to collecting the data and evaluating the results, a review of distance education components was offered.

This section of the study introduced many related concepts including the characteristics that described traditional campus-based classes and those in a distance learning setting. Significant historical occurrences in distant learning education, the growth of Old Dominion University's distance learning program, TELETECHNET, and the characteristics associated with the delivery of courses via technology were also discussed. Chapter II concluded with future developments in education and a summary of the covered material.

TRADITIONAL EDUCATION VS. DISTANCE EDUCATION

While the traditional classroom method of instruction has existed for centuries, distance learning is not a new phenomenon either. However, only in the last decade have distance education programs achieved significant growth. According to a study by the U.S. Department of Education's National Center for Education Statistics (NCES), distance education programs increased 72 percent between academic years 1994-95 and 1997-98 (Lewis, Snow, Farris, & Levin, 1999). Enrollment in these distance-learning

courses nearly doubled during that same period-from 754,000 to 1.6 million (Lewis et al., 1999).

With a much broader definition and an increased range of technologies the concept of distance education has changed dramatically throughout its history. Today's courses can be offered in a variety of ways such as satellite, computer, LAN systems, telephone, video teleconference, and CD-ROM. Phipps and Merisotis (2000) explain that while synchronous communication requires that the teacher and student be present at the same time, asynchronous modes are independent of time and place.

Although the most effective learning environments have always been face-to-face, interactive settings, technology has created many new opportunities for students. "An institution must apply today's technology to its curriculum and programs to meet the customer's needs, to compete with other institutions and possibly even to survive" (Nixon & Leftwich, 1998, p. 1). Students, particularly those with geographical, familial, work, and time constraints, are provided educational opportunities that may have otherwise been impossible were it not for distance education (Sherron & Boettcher, 1997). Through distance learning, students can take classes at their convenience, finish programs they had previously started, have access to a variety of courses, or simply pursue educational opportunities that they otherwise could not have. Robert Tucker, who heads an Arizona-based higher education-research firm called InterEd, estimates that 55% of the 2,215 four-year colleges and universities have courses available off-site (Gubernick & Ebeling, 1997).

TELETECHNET

Old Dominion University, located in Norfolk, Virginia, offers an interactive distance education program known as TELETECHNET. Established in 1992, TELETECHNET offers baccalaureate and master degree programs to students located at over 50 sites throughout Virginia, Indiana, Georgia, Washington, North Carolina and Arizona. As the largest distance-learning provider of its kind, Old Dominion delivers courses to students via satellite enabling them the opportunity to participate as if they were in the same classroom as the instructor on campus.

The following are significant facts about TELETECHNET, as reported by Old Dominion University's distance learning department:

- More than 1700 students have graduated from Old Dominion through TELETECHNET since the mid-1990s.
- TELETECHNET'S three largest programs are offered by the College of Education.
- Because of the need to be more organized and to increase skills in the use of technology, 73 percent of the faculty members who have taught believe they are better instructors as a result of their distance learning experience.
- Registration for Fall 2001 was up by 520 students over Fall 2000, for a total of 6,696. During the same time period, the University's full time equivalences increased by 14 percent among out-of-region students. This is directly attributed to students enrolled in distance learning programs.
- Currently there are 17 classes with enrollment greater than 100. Of these, eight have more than 200 and two classes have more than 300.

- Overall, Virginia Community College System transfers who were associated with a TELETECHNET campus were less likely to experience academic difficulty than main campus transfers.
- First time TELETECHNET students have an 83 percent pass rate on the Writing Sample Placement Test.

POTENTIAL DISADVANTAGES

Naturally, anything that relies heavily on technology is not fool proof and distance education is no different. Both controllable and uncontrollable factors do exist. Nixon and Leftwich (1998) note that if the technology link is not a strong link the project will suffer setbacks and possible failure. "The breakdown of the technology "vehicle" by which the curriculum is to be delivered will force faculty back into a traditional classroom delivery mode" (p. 59).

Instructional delivery via technology has a tremendous effect on both students and faculty. As Constance Ridley Smith (1996) points out, instructors must spend at least six hours of planning for every hour of instruction via distance learning. In order to be successful, faculty members and students must also be more technical "savvy". Just being able to send and receive e-mail is not enough. Reliable and user-friendly equipment is required for distance learning education. Without competent technical support personnel to maintain it, this expensive and constantly developing equipment would be useless.

Other factors affecting the delivery of distance courses include inclement weather, technical problems and accessibility. Despite being great distances apart, a distance-learning course must remain interactive. Dialogue, open communication and participation

are imperative for creating an effective learning environment. Faculty members must be as accessible to their distant students as they are to their campus-based students. Feelings of isolation and inaccessibility can eventually cause the student to give up and/or fail.

TECHNOLOGY

For the delivery of TELTECHNET satellite courses to students at distant sites, Old Dominion utilizes two-way audio, one-way video connections. Simply stated, students can see and hear the instructor while the campus-based faculty member and students can hear those students communicating from a distance site. This type of connection allows for immediate interaction among all those participating as if everyone was under the same roof. The delivery of material can be done through a variety of methods including standard mail, electronically, fax, or e-mail. One significant advantage for TELETECHNET students is that every class lecture is videotaped which allows students the opportunity to view a class at a later time at their own convenience. Electronic chat rooms, bulletin boards and discussion pages are other useful tools for students and faculty to interact, share ideas and provide feedback.

The World Wide Web is a tremendous resource for everyone involved in the educational process. Students and faculty members have unlimited resources including entire libraries at their fingertips. Delivering instructional material via satellite does not limit the amount of resources that can be used. Computer generated slide presentations, videotapes, CD-Rom technology, softboard applications, panel discussions, etc., can all be used for delivery. Basically, all the resources and technology used for entertainment purposes are now being used to deliver educational material.

THE FUTURE OF DISTANCE EDUCATION

Although distance education was often thought of as a “poor and often unwelcome stepchild within the academic community” (Phipps and Merisotis, 1999, p. 29), its continued growth indicates that it is here to stay. With constantly changing societal and economic trends, as well as student needs, distance education providers must continue to evolve and adapt in order to remain competitive. Advances in technology and the ability of institutions to keep up with technological upgrades will ultimately determine the success of distance learning programs. “As Gladioux and Swail (1999) assert, given the fact that computer and related technologies are evolving so quickly—and new providers and brokers of higher education proliferating so rapidly—no one knows how traditional higher education will change” (Lewis, Snow, Farris, & Levin, 1999, p. 56). Regarding the future of distance education, one thing is certain, students will have increased educational opportunities and a variety of formats using a variety of technologies from which to choose from.

SUMMARY

The review of literature examined the significant aspects involved in distance learning education. Areas reviewed included a comparison of traditional and distance education, Old Dominion University’s TELETECHNET distance learning program, potential hazards associated with distance learning, the affect that technology has on the delivery of educational material, and future developments of distance learning education.

Chapter III of this study will analyze and discuss the methods and procedures used to determine if there is a difference between the final grades received by students

taking the common core courses in the Occupational and Technical Studies curriculum via Old Dominion University's TELETECHNET Distance Learning program with those students taking the same core courses in a traditional campus-based classroom setting, in order to determine if one learning environment is more effective than the other.

CHAPTER III

METHODS AND PROCEDURES

Chapter III, Methods and Procedures, of this experimental study sought to determine if campus-based students taking the common core courses of Old Dominion University's Occupational and Technical Studies curriculum achieved higher final grades than students taking the same courses via ODU's TELETECHNET distance learning program. This chapter will describe the research methods and statistical procedures used to collect and analyze the data. Included in Chapter III are the population that were studied, the instrument design that was used, a statistical analysis of the collected data, and summary of the covered material.

POPULATION

Between the spring of 1996 and the summer of 2001 there were a total of 698 final grades collected from students completing any or all of the four common core courses of Old Dominion University's Occupational and Technical Studies curriculum. These four common core courses included OTED-635, OTED-785, OTED-788, and OTED-789. Of the 698 grades that were collected 246 reflected campus-based students and 452 were TELETECHNET student grades. Final grades were collected over a span of 17 semesters including 12 campus-based classes and 12 distance-learning courses.

The students, both male and female, included in the study were all graduate students seeking a Master of Science degree in Occupational and Technical Studies.

INSTRUMENT USE

The instrument used to analyze the collected data were the final grades received by every campus-based and distance student completing any and all of the four common core courses in the Occupational and technical studies curriculum. Final semester grades for each of the four courses were a true measure of the knowledge and understanding of the subject matter taught in each course.

CLASSROOM PROCEDURES

Campus-based students taking OTED-635, OTED-785, OTED-788, and OTED-789 attended classes in the Technology and Gornto Buildings on Old Dominion University's campus located in Norfolk, Virginia, as well as at the various Higher Education Centers. Distance learning courses were offered to students at the various TELETECHNET distant site locations throughout Virginia and across the country.

Classroom settings, materials, resources, accessibility, attendance requirements, exams, assignments, and projects were the same for all students despite the location of their classroom. Although textbooks, materials and instructors varied between the spring of 1996 and summer of 2001, the actual course content and grading procedures remained the same. For the most part, the same faculty members who taught the campus-based courses were the same who taught the distance learning courses.

STATISTICAL ANALYSIS

The final grades of every student that completed any and all the four common courses were compared in order to determine if there is a significant difference between the grades earned by campus-based students and distance learning students. A two-tailed

t-test was used to analyze the data. The final grades of each individual course were compared as well as the overall differences between the campus-based and distance-learning students.

SUMMARY

Chapter III of this study described the methods of data collection and the statistical procedures used to compare the final grades of 698 campus-based and distance learning students that completed any or all of the four common core courses of Old Dominion University's Occupational and Technical Studies program. This chapter identified the population that was studied and the instrument used to analyze the data. Also included in this section of the study were the classroom procedures and a statistical analysis of the data that was collected. The results of this study will determine whether or not one group of students enjoyed a more advantageous learning environment over the other. The findings of this statistical analysis will be discussed in Chapter IV.

CHAPTER IV

FINDINGS

The purpose of this study was to compare the final grades of campus-based and TELETECHNET distance learning students taking the Occupational and Technical Studies common core courses, OTED-785, OTED-788, OTED-789, and OTED-635. This chapter presents all the relevant data that were collected and will provide a statistical analysis comparing the sample means in order to test the null hypothesis.

DATA

Appendix A illustrates the numerical equivalence for the final grades that were assigned, as used by Old Dominion University to calculate GPA. Appendix B contains the campus-based student's final grades. Appendix C contains the final grades of the TELETECHNET distance-learning students. The table of critical values for t is presented in Appendix D and the t-Test statistical results can be found in Appendix E.

The following tables contain raw data about the campus-based and distance-learning courses. Collected data includes number of classes, number of semesters included in the study, and a distribution of all the grades received.

Table 1—Campus-based Classes Information

12 Classes	137	A
	48	A-
17 Semesters	13	B+
	32	B
246 Grades	10	C
	6	F

Table 2—Distance-Learning Classes Information

12 Classes	305	A
	29	A-
	4	B+
17 Semesters	93	B
	4	B-
452 Grades	14	C
	3	F

RESULTS

The sample means of 246 campus-based and 452 distance-learning final grades were collected and calculated using a two-tailed t-test to determine statistical significance. The average final grade for campus-based (M_1) students was 3.5955, while distance-learning (M_2) students had a mean of 3.7394. With a degrees of freedom of 245 at the .05 level of confidence the obtained critical t-value was 1.96. The t-value was -2.539 with a sample size of 246. Results were indicated in Table 3.

**Table 3—Comparison of Sample Means at the .05 Level of Significance
(Two-Tailed t-Test)**

	<u>Sample Size</u>	<u>Mean</u>	<u>Critical t-value</u>	<u>t-value</u>
Campus-Based Grades (M_1)	246	3.5955	1.96	-2.539
Distance-Learning Grades (M_2)	452	3.794		

SUMMARY

This chapter presented the collected data and calculated results in order to determine if there is a difference between the final grades of campus-based and distance-learning students taking the Occupational and Technical Studies common core courses. The sample means were compared and subjected to t-test in order to determine statistical significance. In Chapter V, conclusions will be given based on statistical analysis of the findings and recommendations for the future will be offered.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this experimental study was to determine if there was a significant difference in the final grades between students taking the common core course of the Occupational and Technical Studies curriculum in a traditional campus-based setting and those taking them from the various distance sites of Old Dominion University's TELETECHNET program. This chapter summarizes the study, draws conclusions based on the findings and offers recommendations for further studies.

SUMMARY

In order to determine if there was a significant difference in the effectiveness of learning, the final grades of 12 campus-based classes and 12 distance-learning classes between spring of 1996 and summer of 2001 were collected. The 246 campus-based grades and the 452 distance-learning grades that were collected were converted into interval data and subjected to a t-test in order to compare sample means at the 95% level of confidence.

CONCLUSIONS

This study was based on the following hypothesis:

H_0 : There will be no significant differences in grades between Occupational and Technical Studies common core courses taken via Old Dominion University's

TELETECHNET distance learning program and campus-based classes as determined by grades earned by participating students.

The t-value was calculated at 2.539. This value exceeds the value of 1.96 obtained from the table of critical values at the .05 confidence level. As a result of the obtained t-value being greater than the critical value, the null hypothesis was rejected. There was a difference in grades between Occupational and Technical Studies common core courses taken via Old Dominion University's TELETECHNET distance learning program and campus-based classes as determined by grades earned by participating students. The statistical analysis indicated that the distance-learning students did better.

RECOMMENDATIONS

Due to the fact that distance education programs are increasing so rapidly and it is expected that technology will play a huge role in future education, this study was timely and necessary. Although teaching and learning styles must be altered slightly to accommodate a distance-learning environment, the results of this study indicate that there is no difference between the academic success of campus-based students and distance-learning students. Therefore, it can be said that both settings provide effective teaching/learning environments for students.

As mentioned in the limitations of the study, certain aspects were not accounted for in this study such as student demographics and their motivation for participating in the program. Student and faculty level of comfort with technology was also not addressed. Experience, or lack thereof, with a distance-learning environment could also

have been a factor determining the overall distance education experience and the grades earned.

The following is a list of recommendations to be considered for future studies in area of distance education vs. campus-based education:

1. Faculty members must attend regular training sessions in order to stay current on available resources and to keep their teaching on TELETECHNET skills "fresh".
2. Distance site students should have access to all the resources that campus-based students have such as student services, library resources, advising, and financial aid.
3. A more effective method of assessment and evaluation must be established in order to get a more representative student viewpoint regarding areas such as overall satisfaction, course content, available resources and technical support.
4. Current and future students should be provided the opportunity to become more acclimated to the distance education setting by offering a distance-student training program.
5. Campus-based and distance learning students must be strongly encouraged to recognize and practice proper TELETECHNET etiquette in order to assure the most effective teaching/learning environment.
6. A follow-up study should be conducted to determine the attitudes, interests and educational backgrounds of students taking courses in the Occupational and Technical Studies program.

Most importantly, the researcher recommends that Old Dominion University continue to develop its TELETECHNET distance learning program and the Occupational and Technical Studies department continues to recruit individuals to participate in their programs in both campus-based classes as well as courses offered at the distance sites.

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APPENDIX A**System of Grading Scale****(As used by Old Dominion University)**

<i>Letter Grade</i>	<i>Grade-point equivalence</i>
<i>A</i>	<i>4.0</i>
<i>A-</i>	<i>3.7</i>
<i>B+</i>	<i>3.3</i>
<i>B</i>	<i>3.0</i>
<i>B-</i>	<i>2.7</i>
<i>C+</i>	<i>2.3</i>
<i>C</i>	<i>2.0</i>
<i>C-</i>	<i>1.7</i>
<i>D+</i>	<i>1.3</i>
<i>D</i>	<i>1.0</i>
<i>D-</i>	<i>.7</i>
<i>F</i>	<i>.0</i>

APPENDIX B

Final Grades of Occupational and Technical Studies Common Core Courses
 (OTED-785, OTED-788, OTED-789, OTED-636)
Campus-based students

Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade
#01	4.00	#42	3.70	#83	3.70	#124	2.00	#165	3.70	#206	3.00
#02	4.00	#43	3.70	#84	3.70	#125	2.00	#166	3.70	#207	2.00
#03	4.00	#44	3.30	#85	3.70	#126	.00	#167	3.70	#208	4.00
#04	4.00	#45	3.00	#86	3.70	#127	.00	#168	3.70	#209	4.00
#05	4.00	#46	4.00	#87	3.70	#128	.00	#169	3.70	#210	4.00
#06	4.00	#47	4.00	#88	3.70	#129	4.00	#170	3.70	#211	4.00
#07	4.00	#48	4.00	#89	3.30	#130	4.00	#171	3.70	#212	4.00
#08	4.00	#49	4.00	#90	3.30	#131	4.00	#172	4.00	#213	4.00
#09	4.00	#50	4.00	#91	4.00	#132	4.00	#173	4.00	#214	4.00
#10	4.00	#51	4.00	#92	4.00	#133	3.70	#174	4.00	#215	4.00
#11	4.00	#52	4.00	#93	4.00	#134	3.70	#175	4.00	#216	4.00
#12	4.00	#53	4.00	#94	4.00	#135	3.70	#176	4.00	#217	4.00
#13	4.00	#54	4.00	#95	4.00	#136	3.70	#177	4.00	#218	4.00
#14	4.00	#55	4.00	#96	4.00	#137	3.70	#178	4.00	#219	4.00
#15	4.00	#56	4.00	#97	4.00	#138	3.70	#179	4.00	#220	4.00
#16	4.00	#57	4.00	#98	4.00	#139	3.70	#180	4.00	#221	4.00
#17	4.00	#58	4.00	#99	4.00	#140	3.70	#181	4.00	#222	3.00
#18	4.00	#59	3.70	#100	4.00	#141	3.30	#182	4.00	#223	3.00
#19	4.00	#60	3.70	#101	4.00	#142	3.30	#183	4.00	#224	3.00
#20	4.00	#61	3.70	#102	4.00	#143	3.30	#184	4.00	#225	3.00
#21	3.70	#62	3.70	#103	4.00	#144	3.00	#185	4.00	#226	3.00
#22	3.70	#63	3.00	#104	4.00	#145	3.00	#186	4.00	#227	3.00
#23	3.30	#64	4.00	#105	4.00	#146	3.00	#187	4.00	#228	3.00
#24	3.30	#65	4.00	#106	3.70	#147	.00	#188	4.00	#229	2.00
#25	3.30	#66	4.00	#107	3.30	#148	.00	#189	4.00	#230	.00
#26	3.30	#67	4.00	#108	3.00	#149	4.00	#190	4.00	#231	4.00
#27	3.00	#68	4.00	#109	3.00	#150	4.00	#191	3.70	#232	4.00
#28	3.00	#69	4.00	#110	3.00	#151	4.00	#192	3.70	#233	4.00
#29	3.00	#70	4.00	#111	3.00	#152	4.00	#193	3.70	#234	4.00
#30	3.00	#71	4.00	#112	3.00	#153	4.00	#194	3.70	#235	4.00
#31	3.00	#72	3.70	#113	3.00	#154	4.00	#195	3.30	#236	4.00
#32	3.00	#73	3.70	#114	3.00	#155	4.00	#196	2.00	#237	4.00
#33	2.00	#74	3.00	#115	3.00	#156	4.00	#197	4.00	#238	4.00
#34	4.00	#75	4.00	#116	3.00	#157	4.00	#198	4.00	#239	4.00

#35	4.00	#76	4.00	#117	3.00	#158	4.00	#199	4.00	#240	4.00
#36	4.00	#77	4.00	#118	3.00	#159	4.00	#200	4.00	#241	4.00
#37	4.00	#78	4.00	#119	3.00	#160	4.00	#201	4.00	#242	3.70
#38	4.00	#79	4.00	#120	2.00	#161	4.00	#202	4.00	#243	3.70
#39	3.70	#80	4.00	#121	2.00	#162	4.00	#203	4.00	#244	3.70
#40	3.70	#81	3.70	#122	2.00	#163	4.00	#204	3.70	#245	3.70
#41	3.70	#82	3.70	#123	2.00	#164	3.70	#205	3.70	#246	3.30

APPENDIX C

Final Grades of Occupational and Technical Studies Common Core Courses
 (OTED-785, OTED-788, OTED-789, OTED-636)
Distance learning students

Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade	Sample	Grade
#01	4.00	#57	4.00	#114	2.00	#170	4.00	#227	4.00	#283	4.00	#340	2.00	#396	3.30
#02	4.00	#58	4.00	#115	2.00	#171	4.00	#228	4.00	#284	3.00	#341	2.00	#397	3.00
#03	4.00	#59	4.00	#116	.00	#172	4.00	#229	4.00	#285	3.00	#342	2.00	#398	3.00
#04	4.00	#60	4.00	#117	4.00	#173	4.00	#230	4.00	#286	3.00	#343	4.00	#399	3.00
#05	4.00	#61	4.00	#118	4.00	#174	4.00	#231	4.00	#287	3.00	#344	4.00	#400	3.00
#06	4.00	#62	4.00	#119	4.00	#175	4.00	#232	4.00	#288	3.00	#345	4.00	#401	3.00
#07	4.00	#63	4.00	#120	4.00	#176	4.00	#233	4.00	#289	3.00	#346	4.00	#402	3.00
#08	4.00	#64	4.00	#121	4.00	#177	4.00	#234	4.00	#290	3.00	#347	4.00	#403	2.00
#09	4.00	#65	4.00	#122	4.00	#178	4.00	#235	4.00	#291	3.00	#348	4.00	#404	4.00
#10	4.00	#66	4.00	#123	4.00	#179	4.00	#236	4.00	#292	3.00	#349	4.00	#405	4.00
#11	4.00	#67	4.00	#124	4.00	#180	4.00	#237	4.00	#293	3.00	#350	4.00	#406	4.00
#12	4.00	#68	4.00	#125	4.00	#181	4.00	#238	4.00	#294	3.00	#351	4.00	#407	4.00
#13	4.00	#69	4.00	#126	4.00	#182	4.00	#239	4.00	#295	3.00	#352	4.00	#408	4.00
#14	4.00	#70	4.00	#127	4.00	#183	4.00	#240	4.00	#296	2.70	#353	4.00	#409	4.00
#15	4.00	#71	4.00	#128	4.00	#184	4.00	#241	4.00	#297	3.00	#354	4.00	#410	4.00
#16	3.00	#72	4.00	#129	4.00	#185	4.00	#242	4.00	#298	3.00	#355	4.00	#411	4.00
#17	3.00	#73	4.00	#130	4.00	#186	4.00	#243	4.00	#299	3.00	#356	4.00	#412	4.00
#18	3.00	#74	4.00	#131	4.00	#187	4.00	#244	4.00	#300	3.00	#357	4.00	#413	4.00
#19	3.00	#75	4.00	#132	4.00	#188	4.00	#245	4.00	#301	3.00	#358	4.00	#414	4.00
#20	3.00	#76	4.00	#133	4.00	#189	4.00	#246	4.00	#302	3.00	#359	4.00	#415	4.00
#21	3.00	#77	4.00	#134	4.00	#190	4.00	#247	4.00	#303	3.00	#360	4.00	#416	4.00
#22	3.00	#78	4.00	#135	4.00	#191	4.00	#248	4.00	#304	3.00	#361	4.00	#417	4.00
#23	3.00	#79	4.00	#136	3.00	#192	4.00	#249	4.00	#305	3.00	#362	4.00	#418	4.00
#24	3.00	#80	4.00	#137	3.00	#193	3.70	#250	4.00	#306	3.00	#363	3.70	#419	4.00
#25	3.00	#81	4.00	#138	3.00	#194	3.00	#251	4.00	#307	3.00	#364	3.70	#420	4.00
#26	3.00	#82	4.00	#139	3.00	#195	3.00	#252	4.00	#308	3.00	#365	3.70	#421	4.00
#27	3.00	#83	4.00	#140	3.00	#196	2.70	#253	4.00	#309	3.00	#366	3.70	#422	4.00
#28	3.00	#84	4.00	#141	2.00	#197	4.00	#254	4.00	#310	.00	#367	3.70	#423	4.00
#29	3.00	#85	4.00	#142	2.00	#198	4.00	#255	4.00	#311	4.00	#368	3.70	#424	4.00
#30	3.00	#86	4.00	#143	4.00	#199	4.00	#256	4.00	#312	4.00	#369	3.70	#425	4.00
#31	3.00	#87	4.00	#144	4.00	#200	4.00	#257	4.00	#313	4.00	#370	3.70	#426	4.00
#32	3.00	#88	4.00	#145	4.00	#201	4.00	#258	4.00	#314	4.00	#371	3.30	#427	4.00
#33	3.00	#89	4.00	#146	4.00	#202	4.00	#259	4.00	#315	4.00	#372	3.30	#428	4.00
#34	3.00	#90	4.00	#147	4.00	#203	4.00	#260	4.00	#316	4.00	#373	3.00	#429	4.00
#35	3.00	#91	4.00	#148	4.00	#204	4.00	#261	4.00	#317	4.00	#374	3.00	#430	4.00
#36	3.00	#92	4.00	#149	4.00	#205	4.00	#262	4.00	#318	4.00	#375	3.00	#431	4.00
#37	3.00	#93	4.00	#150	4.00	#206	4.00	#263	4.00	#319	4.00	#376	4.00	#432	3.70

#38	3.00	#94	4.00	#151	4.00	#207	4.00	#264	4.00	#320	4.00	#377	4.00	#433	3.70
#39	3.00	#95	4.00	#152	4.00	#208	4.00	#265	4.00	#321	4.00	#378	4.00	#434	3.70
#40	3.00	#96	4.00	#153	4.00	#209	4.00	#266	4.00	#322	4.00	#379	4.00	#435	3.70
#41	4.00	#97	4.00	#154	4.00	#210	4.00	#267	4.00	#323	4.00	#380	4.00	#436	3.70
#42	4.00	#98	4.00	#155	4.00	#211	4.00	#268	4.00	#324	4.00	#381	4.00	#437	3.70
#43	4.00	#99	4.00	#156	4.00	#212	3.70	#269	4.00	#325	3.00	#382	4.00	#438	3.70
#44	4.00	#100	4.00	#157	4.00	#213	3.00	#270	4.00	#326	3.00	#383	4.00	#439	3.70
#45	4.00	#101	4.00	#158	4.00	#214	3.00	#271	4.00	#327	3.00	#384	4.00	#440	3.70
#46	4.00	#102	4.00	#159	4.00	#215	3.00	#272	4.00	#328	3.00	#385	4.00	#441	3.70
#47	4.00	#103	4.00	#160	4.00	#216	3.00	#273	4.00	#329	3.00	#386	4.00	#442	3.70
#48	4.00	#104	4.00	#161	4.00	#217	3.00	#274	4.00	#330	3.00	#387	4.00	#443	3.70
#49	4.00	#105	3.70	#162	4.00	#218	3.00	#275	4.00	#331	3.00	#388	4.00	#444	3.70
#50	4.00	#106	3.70	#163	4.00	#219	2.00	#276	4.00	#332	3.00	#389	4.00	#445	3.30
#51	4.00	#107	3.70	#164	4.00	#220	2.00	#277	4.00	#333	3.00	#390	4.00	#446	3.00
#52	4.00	#108	3.70	#165	4.00	#221	4.00	#278	4.00	#334	3.00	#391	4.00	#447	3.00
#53	4.00	#109	3.00	#166	4.00	#222	4.00	#279	4.00	#335	3.00	#392	4.00	#448	3.00
#54	4.00	#110	3.00	#167	4.00	#223	4.00	#280	4.00	#336	3.00	#393	4.00	#449	3.00
#55	4.00	#111	3.00	#168	4.00	#224	4.00	#281	4.00	#337	3.00	#394	3.70	#450	2.70
#56	4.00	#112	2.00	#169	4.00	#225	4.00	#282	4.00	#338	2.00	#395	3.70	#451	2.70
		#113	2.00			#226	4.00			#339	2.00			#452	.00

APPENDIX D

Table of Critical Values for T

	One Tailed Significance							
	0.1	0.05	0.025	0.005	0.0025	0.0005	0.00025	0.00005
	Two Tailed Significance							
	0.2	0.1	0.05	0.01	0.005	0.001	0.0005	0.0001
2	1.89	2.92	4.30	9.92	14.09	31.60	44.70	100.14
3	1.64	2.35	3.18	5.84	7.45	12.92	16.33	28.01
4	1.53	2.13	2.78	4.60	5.60	8.61	10.31	15.53
5	1.48	2.02	2.57	4.03	4.77	6.87	7.98	11.18
6	1.44	1.94	2.45	3.71	4.32	5.96	6.79	9.08
7	1.41	1.89	2.36	3.50	4.03	5.41	6.08	7.89
8	1.40	1.86	2.31	3.36	3.83	5.04	5.62	7.12
9	1.38	1.83	2.26	3.25	3.69	4.78	5.29	6.59
10	1.37	1.81	2.23	3.17	3.58	4.59	5.05	6.21
11	1.36	1.80	2.20	3.11	3.50	4.44	4.86	5.92
12	1.36	1.78	2.18	3.05	3.43	4.32	4.72	5.70
13	1.35	1.77	2.16	3.01	3.37	4.22	4.60	5.51
14	1.35	1.76	2.14	2.98	3.33	4.14	4.50	5.36
15	1.34	1.75	2.13	2.95	3.29	4.07	4.42	5.24
16	1.34	1.75	2.12	2.92	3.25	4.01	4.35	5.13
17	1.33	1.74	2.11	2.90	3.22	3.97	4.29	5.04
18	1.33	1.73	2.10	2.88	3.20	3.92	4.23	4.97
19	1.33	1.73	2.09	2.86	3.17	3.88	4.19	4.90
20	1.33	1.72	2.09	2.85	3.15	3.85	4.15	4.84
21	1.32	1.72	2.08	2.83	3.14	3.82	4.11	4.78
22	1.32	1.72	2.07	2.82	3.12	3.79	4.08	4.74
23	1.32	1.71	2.07	2.81	3.10	3.77	4.05	4.69
24	1.32	1.71	2.06	2.80	3.09	3.75	4.02	4.65
25	1.32	1.71	2.06	2.79	3.08	3.73	4.00	4.62
26	1.31	1.71	2.06	2.78	3.07	3.71	3.97	4.59
27	1.31	1.70	2.05	2.77	3.06	3.69	3.95	4.56
28	1.31	1.70	2.05	2.76	3.05	3.67	3.93	4.53
29	1.31	1.70	2.05	2.76	3.04	3.66	3.92	4.51

30	1.31	1.70	2.04	2.75	3.03	3.65	3.90	4.48
35	1.31	1.69	2.03	2.72	3.00	3.59	3.84	4.39
40	1.30	1.68	2.02	2.70	2.97	3.55	3.79	4.32
45	1.30	1.68	2.01	2.69	2.95	3.52	3.75	4.27
50	1.30	1.68	2.01	2.68	2.94	3.50	3.72	4.23
55	1.30	1.67	2.00	2.67	2.92	3.48	3.70	4.20
60	1.30	1.67	2.00	2.66	2.91	3.46	3.68	4.17
65	1.29	1.67	2.00	2.65	2.91	3.45	3.66	4.15
70	1.29	1.67	1.99	2.65	2.90	3.43	3.65	4.13
75	1.29	1.67	1.99	2.64	2.89	3.42	3.64	4.11
80	1.29	1.66	1.99	2.64	2.89	3.42	3.63	4.10
85	1.29	1.66	1.99	2.63	2.88	3.41	3.62	4.08
90	1.29	1.66	1.99	2.63	2.88	3.40	3.61	4.07
95	1.29	1.66	1.99	2.63	2.87	3.40	3.60	4.06
100	1.29	1.66	1.98	2.63	2.87	3.39	3.60	4.05
200	1.29	1.65	1.97	2.60	2.84	3.34	3.54	3.97
500	1.28	1.65	1.96	2.59	2.82	3.31	3.50	3.92
1000	1.28	1.65	1.96	2.58	2.81	3.30	3.49	3.91
Infinity	1.28	1.64	1.96	2.58	2.81	3.29	3.48	3.89

APPENDIX E

t-Test Results

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	VAR00001	3.5955	246	.75172	.04793
	VAR00002	3.7394	246	.55154	.03516

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	VAR00001 & VAR00002	246	.095	.137

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 VAR00001 - VAR00002	-.1439	.88904	.05668	-.2556	-.0323	-2.539	245	.012