Reliability of the Educational Technology Profiler Survey as a Method of Gathering Information in Teacher Preparation Programs

Carmen A. Cornieles

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RELIABILITY OF THE EDUCATIONAL TECHNOLOGY PROFILER SURVEY AS A METHOD OF GATHERING INFORMATION IN TEACHER PREPARATION PROGRAMS

by

Carmen A. Cornieles

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Education Department of Educational Studies

Western Michigan University Kalamazoo, Michigan August 2003

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RELIABILITY OF THE EDUCATIONAL TECHNOLOGY PROFILER SURVEY AS A METHOD OF GATHERING INFORMATION IN TEACHER PREPARATION PROGRAMS

Carmen A. Cornieles, Ed. D.
Western Michigan University, 2003

Education is an important factor in the introduction of technology as tools to be used in the teaching process. Teacher preparation programs for general education and special education are working to ensure that technology is a common denominator method of instruction following standards from teaching accrediting agencies. Institutions in charge of teacher preparation programs are aware of the need to prepare their students effectively and efficiently in the use of technology to support teaching and learning. Students in teacher preparation programs should become knowledgeable on using educational technology in their everyday instruction when placed in a school. For this reason, it has become necessary to measure the technology skill level that students in teacher preparation programs demonstrate. The goal of the Western Michigan University (WMU) Educational Technology Profiler Survey (ETPS) is to appraise the level of technology skills of preservice teachers in introductory technology courses in teacher preparation programs. The intention of the researcher is to find out
how appropriate the ETPS is to gather information from students in the introductory technology courses. Gathering the desired information gives the instructors a better ability to implement the teaching practices they want to convey using the appropriate technology to teach different content.

The research study to be conducted seeks to determine the relationship between academic performance and student technology skills, as well as the interaction between education majors, and genders on student's academic performance. Correlational and other statistical analysis methods were used to study student performance on required class assignments in relation with their responses to the ETPS. The goal was to determine the quality and consistency of the information obtained with the ETPS instrument. Findings suggest the Educational Technology Profiler Survey is a reliable instrument to gather information on technology skills; its relationship with the students' academic performance has yet to be documented.
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DEDICATION

To Helga and Erika, my inspiration, my beautiful daughters.

To Mami y Tia Mayo, as a tribute to your love and teachings.

To Papi y Tio with all my respects, in loving memory.

A wise system of education will at last teach us how little man yet knows, how much he has still to learn.

- Sir John Lubbock.
ACKNOWLEDGMENTS

I wish to express my gratitude and appreciation to those who joined me on my journey culminating my doctoral dissertation. One cannot travel alone or without the support of a great family, friends, colleagues, and professors who, with or without intention, engaged in the most interesting discussions inspiring learning on my part. I thank them all for that.

My many thanks to the members of my Doctoral Committee, Dr. Howard Poole, Dr. Elizabeth Whitten and Dr. Robert Leneway for their assistance, time and dedication. Dr. Poole, as chairperson, guided me through the process and provided me essential feedback, for this I am most grateful. His encouragement and understanding kept me going and on track even when the journey got tedious. Dr. Robert Leneway never hesitated to offer his ideas, resources and information that could lighten my journey, I thank him for that. I also thank Dr. Elizabeth Whitten for her support, feedback and suggestions.

Thanks go to other faculty and personnel at the University, especially to Dr. David Hartmann, a great listener, his advice in the statistical analysis was always clarifying and reinforcing. Drs. Alonzo Hannaford and George Haus inspiring teachers from whom I have learned the joy of teaching in higher education. I also want to thank Ms. Mary Jane Mielke and Ms. Anna
Acknowledgments—continued

Lee Miller from the PT³-CLT³ Grant for their support and diligence helping with so many questions and requests along the process of writing this Thesis. Thanks go to all those who in someway kept me going to reach this milestone.

My gratitude goes to my dearest friends, Dr. Rosario Cañizales, who provided invaluable support during the initial stages of this Thesis, and Dr. Ana Gil-Garcia, for their unconditional professional as well as personal support. I also thank Dr. Antonio Rubino for his support and good advice in the statistical analysis and ongoing process of this work. Thanks go to my dear friend Deborah Lehmann; her help in editing this work was essential.

I want to thank Mark, my husband, for his patience, love and support throughout the final stages of my program and during the process of writing this Thesis. I offer my gratitude and appreciation to my family and friends, who always showed me the love and support I needed to keep going and reaching my goal.

It has been a long road but it was worth every minute and effort. Thanks to every one of you!

Carmen A. Cornieles
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CHAPTER I

INTRODUCTION TO THE PROBLEM

Introduction

This chapter will begin by providing background information on the research problem. After bringing some background information to the reader to establish a context for the problem a formal statement of the research problem will be made. This chapter will include the research question and the purpose of this study. Finally, this chapter will provide a brief overview of the entire thesis study.

Background

Higher education institutions have realized the changes in society, learning processes, learning tools and the impact of innumerable elements in teacher preparation programs. Colleges and universities also recognize the changes and the impact that technology has inflicted in all levels of education (Bennett, 2001; Norton & Sprague, 2001; Klor de Alba, 2000; Beck & Wynn, 1998; Gilligham & Topper, 1999). From preschool to higher education, technology has introduced many different ways to aide and to achieve gains
in the learning process of students. These changes are reflected in general education as well as special education.

Higher education is assuming part of its responsibility through teacher preparation programs. These programs promote the integration of instructional technology into teaching practices. Teacher preparation programs for general education and special education are working to ensure that technology is a common denominator in methods of instruction. This high level of focus on pre-service teachers assures a successful use of educational technology by colleges and universities. It also reflects these institutions’ interest in developing effective and reflective teachers for the future (Bennet, 2001; Duhaney, 2001).

University programs for teachers should model instructional practices expected and required by accrediting agencies. Thus, the curricula should be revised to include new and emergent technologies (Holland & Moore-Steward, 2000). Standards, such as those from the International Society of Technology in Education (ISTE), have been created to provide a sense of what new teachers must know and be able to do, especially using educational technology (Bennett, 2001; Duhaney, 2001; West, 1999).

Teacher preparation programs are designed following standards from accrediting agencies (Zehr, 1998). The National Council on Accreditation of Teacher Education (NCATE) is the accrediting agency for teacher preparation
programs in the United States (West, 1999). The Council for Exceptional Children (CEC) is the national association that sets professional standards for professionals who provide services to individuals with exceptionalities. The International Society for Technology in Education and its National Educational Technology Standards (ISTE-NETS) is the agency providing standards for the use and inclusion of technology in education.

The aforementioned professional groups are some of the most prominent organizations that set standards for teacher preparation programs in the United States (Duhaney, 2001; Bybee, 2001; West, 1999; Holland & Moore-Steward, 2000; Alobiedat & Poole, 2000; Schmoker & Marzano, 1999; Zehr, 1998; Cooper & Bull, 1997). Their main interest or goal is to make sure that teacher preparation programs provide an appropriate education for potential teachers of American youth (Duhaney, 2001). The International Society for Technology in Education in collaboration with NCATE and other organizations has developed the National Educational Technology Standards (NETS) for students and teachers. The main goal of ISTE-NETS is to aid teachers as well as students to become effective technology users with the ability to live, learn and work successfully in a continuously changing society (ISTE, 2000). Teacher preparation programs at colleges and universities must include preparation on these skills in the curriculum (Bennett, 2001; West, 1999; Bryant, Erin & Lock, 1998).
One of the teacher's responsibilities is to establish a classroom environment that is inviting to learning (Cronis & Ellis, 2000; Smith, 2000). With the help of educational technology, it is possible for teachers to provide a variety of learning opportunities for all types of students. Consequently, teachers in the field need to be prepared to use educational technology effectively (Bennett, 2001, West, 1999). Standards set guidelines in the creation of teacher preparation programs. Universities, following these guidelines, should provide opportunities to produce technology-capable preservice teachers. In other words, students in teacher preparation programs should become knowledgeable on using educational technology in their everyday instruction by the time they are placed in a school (Duhaney, 2001).

The College of Education at Western Michigan University (WMU) houses one of the Preparing Tomorrow's Teachers to Use Technology (PT³) grant programs. As the PT³ programs strive to prepare preservice teachers nationwide, it has become necessary to measure the level of technology skills that students in teacher preparation programs demonstrate. For this purpose, WMU- College of Education, as part of a student-centered-research university, has developed a technology skills survey. This instrument is the Educational Technology Profiler Survey (ETPS). This instrument was based on the ISTE-NETS standards and developed using the Profiler assessment system. The goal of the ETPS is to appraise the level of technology skills of
preservice teachers in introductory technology courses in teacher preparation programs at this university.

General Statement of the Problem

The intention of this research study is to provide valuable information to the instructors and course designers in the teacher preparation programs at WMU. The information would be helpful to them in improving courses that meet today's technology challenges for teachers in the field. And, indirectly, through the technology introductory courses, provide preservice teachers with tools to help students in their K-12 classrooms and have their K-12 students acquire higher level skills that will let them encounter, analyze and resolve more effectively actual life situations (Newby, Stepich, Lehman & Russell, 2000).

In the process of looking for the answers to the problems stated in this research study, the researcher will also attempt to find out how appropriate the ETPS is to gather information from students in the introductory technology courses. The fact that the ETPS is consistent in providing the level of technology skills of students is of great value for the instructors in the course. At the same time, gathering the desired information gives the instructors a better ability to implement the teaching practices they want to convey using the appropriate technology to teach different content. As a
result, determining the reliability of the ETPS will provide valuable information that will contribute to the improvement of introductory technology courses in teacher preparation programs at Western Michigan University.

The research study to be conducted seeks to determine the relationship between academic performance, measured by course assignments and grades, and student technology skills, as measured by the ETPS survey. The study will also explore the relationship between academic performance, education majors, and/or gender. At the same time, the researcher will attempt to determine the reliability of the self-reported Educational Technology Profiler Survey as an instrument to gather information in teacher education programs at Western Michigan University. This research study involves a survey completed by students in two introductory technology classes in general education and special education teacher programs. The researcher will use correlational and Two-Way Analysis of Variance methodology to study student performance on required class assignments in relation with student’s responses to the ETPS.

Research Questions and Purpose of the Study

The researcher along with the instructors in the introductory technology courses in the teacher preparation programs at WMU think it is
necessary to know the level of technology skills that preservice teachers have in order to best prepare instructional programs to help them increase their technology skills and subsequently their teaching skills. Another interest of the researcher is related to exploring if there are differences among students in terms of academic performance, education majors, and gender. In other words, differences between students in elementary education and those in special education programs, and if there is a gender difference in technology skills or their academic performance, given recent research reported by Kimura (2002) on sex, learning and the brain. To explore these issues a research study was developed.

The purpose of this research study is to explore the following questions:

Is there a relationship between academic performance and the technology skills of students in the introductory technology courses in teacher preparation programs at Western Michigan University?

Is there an interaction between education major and gender on the academic performance of students from introductory technology courses in teacher preparation programs at Western Michigan University?

The researcher hopes that the answers to the above mentioned research questions will 1) determine the reliability of the Educational Technology Profiler Survey instrument used in the introductory technology courses in
teacher preparation programs at Western Michigan University. And, 2) demonstrate the level of interaction between the variables, education major and gender relative to the academic performance of students in the courses involved in the study. These results will provide the researcher and the instructors with valuable feedback for the improvement of the introductory technology courses in the aforementioned programs.

Overview

Chapter I provided background information to help the reader situate him or herself in the context of the problem. It presented a general statement of the problem; the questions addressed in the study and also stated the purpose of the study.

A review of the literature is presented in Chapter II. The review of the literature will present other perspectives brought by different authors. It will present information in greater detail to provide the reader with a more comprehensive background on the context of the study. This background will include the role of the technology in education. Also, it will discuss the importance of technology in teacher preparation programs, including aspects related with general education, as well as special education. This chapter will also present findings in the literature on self-reported surveys as well as web-based surveys.
Chapter II will also include a section presenting the Profiler system, where the Educational Technology Profiler Survey is housed as well as Blackboard and WebCT as the course management web-based systems used in the introductory technology courses in the College of Education at WMU. And finally, but not least important there will be a separate section presenting studies found in the literature on studies related to the reliability of different instruments, including surveys.

Chapter III will provide an overview of the methodology. This chapter will provide information on the context where the study takes place. There will be separate sections presenting the institutional setting, the subjects participating in the research study as well as the intervening dependent and independent variables. Also, the chapter will present an overview of the process followed for the collection and organization of the data. Finally, the chapter will present information on the statistical analysis methodology to be used in the study in order to prove the research hypotheses proposed for this research study.

Chapter IV will contain the findings of all statistical analysis done and how those findings relate to the research questions posted in Chapter I. It will also discuss these findings and their impact on proving or rejecting the different hypotheses presented in this study.
Chapter V will summarize the entire study. It will present a summary of the problem, the methods, and the findings. It will also present the conclusions drawn by the researcher, as well as recommendations for further research.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

This chapter will provide an introduction to the role of technology in education. The chapter will build on this background to review the literature addressing the different aspects related to technology and education, as well as, validity and reliability studies. These aspects will provide an essential background for those who are not familiar with the subject. The first section will present an overview of technology in education, covering funding, Preparing Tomorrows’ Teachers to Use Technology grants, and standards in technology, and education. It will also present a general idea of the technology in regular education and in special education in teacher preparation programs.

The second section will talk about surveys and web-based surveys found in the literature. It will also cover Profiler, Blackboard and WebCT as the systems used in the management of the courses related to this research study. This section will build an overview of the literature in the field related to teaching technology and computer skills, as well as, education majors and gender. The third and last section will review research related to reliability and validity studies on self-reported and web-based surveys.
Overview of Technology in Education

Computer technology has become an important aspect of today's society. It has offered different and sometimes more effective ways to solve problems and achieve results that ordinarily would have taken a great deal of effort in the past. Individuals are expected to be competent in the use of computer technology for many different purposes, resulting in a better quality of life. Education has a key role to play in the process of ensuring that citizens are capable of meeting today's technology challenges. Education is also an important factor in the introduction of technology as a tool to be used in the teaching process (Cooper & Bull, 1997; Stevenson, 1997; Thomas & Sullivan, 1998; Klor de Alba, 2000; Roblyer & Edwards, 2000; Smith-Gratto & Fisher, 1999; Forcier, 1999).

Institutions in charge of teacher preparation programs are aware of the need to prepare their students effectively and efficiently in the use of technology to support teaching and learning. The Office of Technology Assessment (1995) in its report claims that much of the effort when instructing technology is on teaching about it and not on teaching with it across the curriculum. "The challenge given by National Council on Accreditation on Teacher Education (NCATE) to make 'technology central to the teacher preparation process' eventually will be met by those entrusted to prepare teachers for the 21st Century classroom" (NCATE, 1997; West, 1999). It is an important factor for higher education institutions to facilitate the involvement of faculty in the use of technology. At the end of the last decade, data showed that "a minority of instructors were involved in such use" (West, 1999). Thus, these institutions have to promote the training and use of
technology among their faculty as a teaching tool instead of a productivity tool.

An important element in the use of technology in education is to focus on technology as a tool to provide students an effective education. This focus should be maintained independent of the modality, regular education or special education, rather than making technology the focus of the students' education (Bennett, 2001; Holland, Moore-Steward, 2000; Bryant, Erin & Lock, 1998). This element is often a common misunderstanding among professionals in the field of education whose interpretation has been to provide technology in their curriculum instead of using the technology as the vehicle to teach (Duhaney, 2001; Holland & Moore-Steward, 2000).

One way to change this conception was addressed by NCATE in the revision of its standards for the year 2000 (NCATE, 1997). During the late nineties, the Council, with support from other organizations, established a task force to address and make recommendations on technology related issues in education (Cooper & Bull, 1997). Among the recommendations, NCATE suggested to make the standards performance-based and technology a central focus to the teacher preparation programs (NCATE, 1997; Duhaney, 2001). These changes in NCATE standards will require instructors in teacher preparation programs to infuse technology into their teaching practice. At the same time, they will be expected to prepare their students to do the same (Bennett, 2001; West, 1999).

Today's educators are aware of the importance of technology in their teaching and the education of their students (Bybee, 2001). The expectation is that technology will provide learners with opportunities to achieve higher
levels of literacy, decision-making and better understanding of their environment. Over the years, studies have demonstrated the relationship between technology and teacher education (Duhaney, 2001). It is time for teacher preparation programs to make sure that they provide their participants the technology skills they will need to facilitate their teachings, and that will meet the technology standards posted by ISTE-NETS in collaboration of NCATE, and other organizations related to education.

In this sense the Department of Education has created a series of grants and programs targeted at the integration of technology in education. There is one of such programs, in particular, that interests the researcher for the purpose of this study. This is the PT³ "Preparing Tomorrow's Teachers to Use Technology".

**Preparing Tomorrow's Teachers to Use Technology Grant (PT³)**

The U.S. Department of Education is addressing integration of technology into instruction with its nationwide program "Preparing Tomorrow's Teachers to Use Technology." In the past, the idea of integrating technology into the regular classroom curriculum was a relatively weak component of teacher preparation (Yildirim, 2000). To help correct this weakness, a federal grant, Preparing Tomorrow's Teachers to use Technology (PT³) was developed. This grant provided resources to determine what teacher training institutions need to do to help teachers learn computer integration skills in order to increase the learning advantage for all students. (Farnsworth, Shaba & Bahr, 2002).

This technology program provides funds to institutions interested in working toward preparing teachers to become more proficient in the use of
current educational teaching/learning technologies. The goal of the PT³ program is to prepare technology-proficient teachers to teach in this new century, specifically targeting low-income or rural populations (Duhaney, 2001; West, 1999). In its Collaborative Exchange Guide, the PT³ Program (2002) expresses its intent to respond to the great and compelling need to prepare preservice teachers to be technology-efficient, proficient, and able to explore new technology for teaching and learning in a competent and non-traditional way.

The Preparing Tomorrow's Teachers to use Technology program seeks to enhance the integration of technology in teacher preparation programs nationwide and to support innovative teacher preparation program improvements. These efforts are created in partnership between higher education institutions, state agencies, school districts, nonprofit, and other organizations who are joining forces to develop well-prepared, efficient and technology-proficient educators. To maintain this enterprise, the U.S. government, through the Department of Education, has invested millions of dollars during the past three years funding a large number of projects. The U.S. Department of Education (2002a), reports that

...since 1999, the Preparing Tomorrow's Teachers To Use Technology (PT³) Grant Program has funded innovative projects for 441 educational consortia nationwide with a total program funds of $337.5 million. This program serves more than 35 Historically Black Colleges and Universities and more than 25 Hispanic Serving Institutions. It reaches 52 of the 100 largest
teacher preparation programs. Amongst the kinds of activities funded, there is: faculty development, course restructuring, certification policy changes, and online teacher preparation, which at the same time covers different areas, such as, enriched-networked-virtual, video case studies, electronic portfolios mentoring triads, and embedded assessments.

The PT³ program since the beginning of its years of funding has been reported to have “projects started to activate change in teacher preparation programs across universities” (Smith, 2001). The PT³ program recognizes that teachers need to be knowledgeable, skilled, and able to integrate the broad variety of technology in their everyday teaching. Thus, their training must revolve around effective ways to use technology as an essential teaching tool. Initiatives from the PT³ go beyond the mere access to technology to create a new learning environment for students. Accordingly, a primary intent of the PT³ programs is to provide the teaching work force with effective professionals, who have the ability to use technology effectively (PT³, 2002). Hopefully, professionals in special education, as well as regular education, are getting involved in teacher preparation programs that are part of a local or regional PT³ initiative. Optimistically, they have realized the impact on subsequent integration of technology across teacher education.

Based on the presentations at the 2001 PT³ Summit held in Washington, DC, it does not seem that many special education teacher preparation programs are partners in this initiative (Smith, 2001). There are some programs that included special educators but the representation or
involvement is limited. Most presentations dealt with the use of technology in the regular education setting without considering issues related to students with disabilities. Presentations at the Summit focused on technology initiatives across general curriculum preparation with limited consideration, and more importantly, limited participation amongst the special education faculty and their students at these various institutions (Smith, 2001). Although special education appears to be underrepresented, the information shared from the projects at the PT³ Summit has much to offer special education teacher educators seeking to model effective technology use.

Of interest of both regular and special education is the development of a variety of products and models that ultimately enhance instruction (Department of Education, 2002; Smith, 2001). These products and models have resulted out of the efforts of universities and colleges across the country involved in the PT³ program. Even more beneficial for education all of these new resources, "focused on the further integration of technology in the teacher preparation environment to enhance its use in the preK-12 classroom (Smith, 2001)."

During the PT³ period, institutions have been given the opportunity to design and implement new or different ways to make the best use of technology in the teaching-learning process. Smith (2001) highlighted an excellent collection of projects that were presented at the 2001 PT³ Summit. Of particular interest to this research study were the projects pertaining to electronic portfolios, and video-based tools.

Among the electronic portfolios, The Montana State University-Northern (MSU-N) in partnership with other local institutions presented their
experience; Native American pre-service teachers at a tribal college develop electronic portfolios. MSU-N also discussed how PT3 has enhanced its teacher preparation program. Alcorn State University presented a detailed electronic portfolio of reflective thinking and practice as an outcome of their field experiences, showing students' portfolios as evidence that these interventions significantly improved the quality of student teachers' reflections about learning.

Another area covered at the Summit was video-based tools. University of North Texas' experience relates to creating video-based modules, a tool for assessing and training the preservice teachers' observations and reflections on the teaching practice, developed for the Technology Leadership Institute (TLI). University of California at Irvine had an interactive presentation of a video case-based tool used to assess and train preservice teachers' observations, interpretations, and reflections on teaching practices. The last project on video-based tools was presented by Bemidji State University, another example of the benefits and challenges of digital video in teacher education delivery, research, assessment, and reflection.

It is the researcher's observation that with the PT3 program in place, professors, student teachers, in-service teachers and administrators nationwide are discovering how they can effectively enhance student learning by integrating technology in their curricula. Together, with a variety of other incentives and resources available, the PT3 program is becoming a key element in transforming teacher preparation programs across the nation.

At a state level, in Michigan, approximately $80 million was the federal funding education budget for the year 2000 (PT3-CLT3 website, 2002). This
sum was dedicated to prepare students for the 21st century learning. At this time, it is of great importance to bring technology up to speed in the classrooms, due to the known impact on the teaching-learning process. Using technology to help students in their learning process is just the beginning of what is to come in this 21st century in terms of the teaching-learning process. Western Michigan University houses one of the PT³ Projects.

The main and ambitious goal of Western’s PT³ program CLT³ - Collaborative Learning & Teaching Through Technology Project is to “ensure and document that the 800 graduating WMU pre-service teachers each year meet or exceed, and practice rigorous standards of collaborative learning practices for integrating technology in the classroom (PT³-CLT³ website, 2002).” The project Director, Dr. Leneway, reports that after the first year the project has executed well its vision and reached these milestones:

1. The first large group (500) of students in the College of Education to produce electronic portfolios, which detail and document their technology competences. 2. The first group of students in the university to test http://homepages.wmich.edu, a totally new student friendly web site development project, jointly developed by the Office of Informational Technology and PT3 program staff. 3. The first pre-service students in Michigan and among the first in the nation to use a Profiler survey for documenting self-evaluation mastery of the ISTE standards with individual ISTE based performance indicators.
support by on-line training materials. 4. The first large group of preservice students to use and help develop Taskstream.com for teaching pre-service students to use a set of on-line curriculum development tools for integrating both technology and state and national standards into project-based lesson plans. 5. The first large group of pre-service students in the nation to develop and submit collaborative teacher preparation and teacher material web sites to the new PT3 catalyst supported, national ThinkQuest on-line curriculum resource library. 6. The first group of faculty (along with only 4 other U.S. universities and colleges) to develop a new ThinkQuest Guided Partner process for training preservice teachers to develop collaborative web sites for engaging students in dynamic interactive learning. (PT3-CLT3 website, 2002).

The main goal of the project, presented by Hartmann, Finley and Wilson (2001) is "to enable all WMU pre-service graduates to proficiently use technology to engage students in 21st century collaborative learner centered environment." From this goal Hartmann, et al. also present five specific objectives that derived from the main goal. These objectives are:

(1) By June 1, 2003, 85 percent of all graduating WMU preservice teachers will demonstrate that they are able to meet or exceed the new ISTE technology standards. (2) By June 1,
2002, at least 90 percent of all graduating WMU preservice teachers will be provided with authentic assessment of their ISTE technology standards achievement. (3) By June 1, 2002, at least 25% of the faculty will have integrated the new ISTE standards into their curriculum. (4) By June 1, 2002, all WMU faculty will have had the opportunity to learn to model the use of collaborative and interactive technology in their curriculum offerings including the use of electronic portfolios. And, (5) By June 1, 2002, an extended continuous learning network will have been developed and used by pre-service teachers, faculty, and supervising teachers.

The PT³-CLT³ project also established partnerships with other public and private organizations in the academic and financial areas. These organizations are: IBM, Microsoft, the ThinkQuest Foundation, Smartforce, and TaskStream, as well as over 50 Southwest Michigan K-12 schools. Units at Western Michigan University have also felt the impact of the PT³-CLT³. These units are: in the academic aspect, in terms of curriculum, the College of Education, College of Arts and Sciences, College of Fine Arts; in terms of the technology support structure, the Office of Information Technology; in terms of research, the Office of Institutional Research; and, in terms of relations with the community, the pre-K-12 schools in the area as well as mentor teachers working with intern preservice teachers from the College of Education.

Through this partnership, organizations have provided resources in
different ways. For example, the Microsoft Corporation donated $50,000 in licensing fees for two computer labs located in the College of Education; IBM has donated $200,000 worth in equipment and materials to develop a national online support center to prepare people with disabilities for careers in information technology and enhance the technology skills of the teachers who serve them; and, ThinkQuest provided a platform for students to launch some of the projects required in the EDT 347 - Technology in Elementary Education course linked to the PT³-CLT³ project (PT³-CLT³ website, 2002).

The project’s effort has not stopped with the preservice students in the teacher preparation program. It has also worked with almost all university faculty attached to the pre-service teacher preparation program. Faculty from the PT³-CLT³ project have held meetings and demonstrated technology supported tools that faculty involved in preservice teacher preparation can incorporate into their teaching practice. On occasion, these efforts have involved holding workshops, meetings, and/or presentations at departmental meetings (PT³-CLT³ website, 2002). As an example of these efforts, a three-day intensive workshop, supported and approved by the College of Education administration was provided specifically for secondary faculty. It had a strong attendance of 20 participants (Hartmann, Finley & Wilson, 2001).

At the end of the first year of the project, an evaluation report was completed. In that report several significant outcomes were revealed (Hartmann, et al. 2001). Outcomes included, "ThinkQuest projects have been developed in EDT 347 and were among the first to access the ThinkQuest server and pilot the initiative for preservice teachers." The project had
provided a series of workshops and training on different technology tools for faculty, staff and seminar coordinators. Examples of the technology tools provided in the workshop are Dreamweaver, ThinkQuest, TaskStream, and Classroom Connect. An overall workshop evaluation done with a Zoomerang survey of 10 participants was strong and positive. A particularly significant outcome was the successful effort of Dr. Carey-Webb to “integrate technology into the preparation of teachers at the university in departments and courses outside of the College of Education...” (as cited in Hartmann, Finley & Wilson, 2001).

For the second year, the evaluation team reported that year two of the project was filled with achievements. Interviews and surveys were given to participants of workshops and professional development efforts and the evaluations were very “positive and strong.” An integration of technology in teaching practices is evident among participants, reflecting the furthering process from “tools-focused technology to a stress on content” (Hartmann & Finley, 2002). Faculty development continued through the mini grants and workshops, plus the sponsoring of speakers on different technology tools and the creation of the tech-savvy student program where tech support was provided to faculty in the software learning process and/or development of WebPages for the courses.

In their conclusions, Hartmann & Finley (2002) provide a good review of the EDT 347 – Technology in Elementary Education course. The EDT 347 course continued to see improvements amongst the students in terms of the appropriation of technology skills through the semester, “consistent with ISTE standards.” Students in the course improved overall. The ThinkQuest
projects also improved, becoming hard evidence of the quality of job done in the course. The course website was “updated and expanded during the school year as well.” Another aspect presented in the second year evaluation conducted by Hartmann and Finley (2002), is that grant faculty have maintained their effort to keep in touch with professionals in the field. Reaching out to the local schools, teaching interns and mentors has been of great value for the project in terms of meeting their objectives. The grant faculty has also made presentations at professional conferences and events to disseminate their progress. These presentations have taken place at COATT Meetings 2001, and 2002; as well as to other COATT Projects. The Future of Learning Conference, a ThinkQuest event, 2002. The Society for Information Technology and Teacher Education - SITE -Conferences, in 2002, and 2003. SITE is a Society of the Association for the Advancement of Computing in Education (AACE).

It is easy to appreciate, through the evaluation reports of the first two years, that the PT3-CLT3 project has dedicated good efforts and time to make technology an important element in preservice teacher preparation programs. Hopefully, when these students become professionals in education, they will integrate the technology tools learned in the teacher preparation programs at WMU, into their teaching.

Standards in Education

The purpose for standards in education is to “serve as a catalyst for change in technology education” (Bybee, 2001). These standards come from organizations that focus their goal into providing the education field with excellence not only in terms of teaching but also in terms of professionals and
their teaching practice (Duhaney, 2001; Smith, 2000). “It is important to note, however, that standards were only the first step, and that, among other things, curriculum reform and professional development should be viewed as the next phase of reform in technology education” (Bybee & Loucks-Horsley, 2000). Standards in general are critical companions not only for technology but all areas in teacher preparation programs in higher education.

In relation to teacher preparation programs and higher education the National Council on Accreditation on Teacher Education (NCATE) is the major sentinel for the teacher education programs nationwide. “NCATE is directly addressing the need for new teachers to be competent in the use of technology in their own teaching” (West, 1999). In relation to the special education practice, the Council for Exceptional Children (CEC) has established a “Code of Ethics and Standards for Professional Practice for Special Educators” (CEC, 1998) that provides a clear framework of the knowledge and skill required of professional for the assurance of quality education for students with disabilities. These guidelines are taken into consideration for NCATE standards for special education teacher preparation programs. These teacher preparation programs not only ensure that students meet standards but also make them aware of the rules and regulations resulting for the Individuals with Disabilities Education Act (IDEA’97).

Universities and colleges work hard to meet all requirements established by these organizations, by making changes and accommodations to assure that programs satisfy accepted professional standards and practice. By the same token, when students are looking for teacher training programs, accreditation by NCATE is an important indicator of the quality of the
programs. "Educational institutions are under great pressure to be relevant and responsive to the needs of the students they prepare" (Alva & Kim-Goh, 1999). Accreditation assures students that they will receive training that meets professional standards, that will hold up in a competitive job market, and that they will be prepared to meet the challenges of professional teaching environment.

**Standards in Technology**

As standards for education and teacher preparation evolve to meet the changing needs of students and society, they also "serve as a catalyst for change in technology education" (Bybee, 2001). For example, NCTE has taken measure to address the "need for new teachers to be competent in the use of technology in their own teaching" (West, 1999). In addition, "integration of new technologies into the learning process is a common thread in the standards established by numerous national associations, i.e. NSTA, NCTM, ISTE" (Farenga & Joyce, 2001). These are different organizations trying to establish standards in technology for teachers and students. For the purpose of this study, the researcher will focus on The International Society for Technology Education (ISTE).

There is a long list of collaborators in the ISTE-NETS project. Organizations in the project partners group are such as the American Association of School Librarians (AASL), a division of the American Library Association (ALA), the American Federation of Teachers (AFT), the Association for Supervision and Curriculum Development (ASCD), The Council for Exceptional Children (CEC), the Council of Chief State School Officers (CCSSO), the National Association of Elementary School Principals...
(NAESP), the National Association of Secondary School Principals (NASSP), the National Education Association (NEA), the National Foundation for the Improvement of Education (NFIE), the National School Boards Association’s (NSBA) ITTE: Education Technology Programs, the Software Information Industry Association (SIIA).

Apple Computer, Inc., the Milken Exchange on Education Technology, the National Aeronautics and Space Administration (NASA), and the U.S. Department of Education through the Learning Technologies Division (LTD) are the ISTE-NETS project cosponsors. The Project also has a group of partners from the PT3 program, besides Apple, and the Milken Exchange on Education Technology which are in the cosponsor group, there is the California State University at San Marcos, the Intel Corporation, the NASA Classroom of the Future, the National Council of Accreditation of Teacher Education (NCATE), and the North Central Regional Education Laboratory (NCREL).

In addition, the ISTE-NETS project includes the following contributors, among which are found the Classroom Connect, Knowvation Incorporated, the Learning Company, the Microsoft Corporation, the Semiconductor Industry Association, and T.H.E. Institute, a division of professional development of Technological Horizons in Education (T.H.E). With this wide range of collaborators and their individual goals geared towards different areas in education and business, the ISTE-NETS project has a very comprehensive perspective as it faces its task of developing standards for students and teachers to integrate technology in education.

ISTE is a nonprofit professional organization with a membership
mainly consisting of educators interested in using technology in education. This is an organization devoted to improve education through the use of technology. In combination with a group of other national associations, ISTE has developed a set of standards for teachers, students, and administrators.

The National Educational Technology Standards for Teachers (NETS-T) Project is an ISTE initiative funded by the U. S. Department of Education’s PT3 grant program (ISTE, 2000). The ISTE’s PT3 grant has been design to:

1. develop for all teachers a comprehensive set of performance-based technology standards reflecting the fundamental concepts and skills for using technology to support teaching and learning;
2. define essential conditions for teacher preparation and school learning necessary for effective use of technology to support teaching, learning, and instructional management;
3. develop standard-based performance assessment tools to measure achievement of the technology standards and to serve as a basis for certification, licensing and accreditation;
4. disseminate models of teacher preparation in which candidates receive experiences that prepare them to effectively apply technology to support student learning; and
5. establish the National Center for Preparing Tomorrow’s Teachers to Use Technology (NCPT3), which will provide coordination, leadership and support for the PT3 initiative and dissemination
of program’s results (ISTE, 2000).

ISTE not only directs the National Educational Technology Standards for Teachers Project counts on the collaboration of other organizations but also provides support for educators. This support is focused in the following areas:

(1) curriculum ideas for the classroom in Learning and Leading in Technology – L&L; (2) Special Interest Group for Teacher Educators – SIGTE; (3) research in teacher education and models and curriculum for teacher preparation in SIGTE’s journal – Journal of Computers in Teacher Education; (4) books in technology education and its use in the classroom; (5) symposia and other special events addressing current topics, resources, and trends in teacher education and teacher professional development; (6) collaboration with the National Educational Computing Conference – NECC- to ensure an exemplary strand on teacher education for the annual conference; and (7) workshops for teachers and teacher educators based on the NETS-S and NETS-T” (ISTE, 2000).

The NETS, originated by ISTE’s Accreditation and Professional Committee, states its primary goal is “to enable stakeholders in PK-12 education to develop national standards for the educational use of technology that facilitate school improvement in the United States” (ISTE, 2000). The
NETS main task is to provide standards that would offer guidelines to leaders in education in identifying and addressing the minimal circumstances for an effective integration of technology in teaching at schools. The Project has provided standards for students, teachers, and administrators. For the purpose of this study, the researcher has focused her attention on the standards for teachers at the preservice level.

The ISTE-NETS Project has defined four major performance profiles for teacher preparation (ISET, 2000). These profiles are general preparation, professional preparation, student teaching/internship, and first-year teaching. The first two tiers relate directly to the different level students in teacher preparation programs. The general preparation tier holds students at the entry level, such as freshman and sophomore students. The students at the junior and senior level represent the professional preparation tier, while the other two tiers are self-explanatory. However, the project does not intent to be statutory or confining, it is just a way to provide guidelines for programs to be able to establish benchmarks that would make them original in their program design (ISTE, 2000). Each of these four profiles relate to a collection of elements, or set of conditions that need to be in place at universities or colleges/school of education, and school sites for teachers to create learning environments conducive to an effective use of technology.

The profiles mentioned above make up the “essential conditions for teacher preparation” (ISTE, 2000). The ISTE-NETS project is interested in having traditional and innovative approaches meld together to facilitate a learning process that will be interesting for students while addressing their individual learning styles. Some elements that are considered to be important
to reach this end are shared vision, access, skilled educators, professional development, technical assistance, content standards and curriculum resources, student-centered teaching, assessment, community support, and support policies.

The profiles established by the ISTE-NETS, described above, lead the researcher for this study to conclude that preservice teachers trained in these programs will be better prepared to integrate technology into their learning and their teaching. At the same time, the researcher thinks that with all the essential conditions in place, the standards can provide the guidelines necessary at each profile tier. This, in turn, will result in teachers who can model an effective use of technology in their own learning and in their teaching practice when placed in their own classrooms.

Technology in Teacher Preparation Programs

Technology permeates society and touches everyone's life in incalculable ways (Lumpkin & Clay, 2001). Large corporations, the banking industry, airlines, in general most businesses could not bear the thought of carry on their tasks without technology. School and college graduates must be computer literate (ISTE, 2000) in order to succeed in life and in the work force (Bitner & Bitner, 2001). In reality, the educational system is lacking ways in its utilization of technology to make the best of it in the teaching-learning process (Hill & Somers, 1996). Similarly, teacher preparation programs have struggled with the issue of how to teach, considering the variety of technologies available to enhance living conditions and improve the teaching process (Yildirim, 2000). It is, therefore, essential for teachers to receive appropriate technology training during their preservice education if the goal
is to meet their students’ needs in the classroom.

There is a large body of literature support for the fact that the leading barrier using technology in the classroom is the inadequate teacher training (Beaver; Brooks, & Kopp; Ingram; Vagle, & College; Yaghi; Yildirim, & Kiraz, as cited in Yildirim, 2000). Authors in the early nineties were concerned with teachers teaching the same way used in the fifties and sixties and not addressing the needs of the Information Age (Perkins, 1992; Moursund, 1989, as cited in Yildirim, 2000). However, the report “Teachers and Technology: Making the connection” from the Office of Technology Assessment (U.S. Congress, 1995) presents important facts. The report predicted that American schools have 5.8 million computers in use for instruction. However, a considerable number of teachers report little or no use of computers for instruction. OTA (1995) also reveals that teachers tend to use technology in traditional ways rather than as a tool to enhance learning or stimulate critical thinking. The same report also states “only 3% of the instructional rooms in schools in the United States were connected to the Internet, although 35% of the schools have access to it.”

Years later a transformation has taken place, the National Center for Education Statistics in its survey detects that 99% of full time, regular education teachers in public schools have access to computers or the Internet in schools (Jones, 2001). However, approximately one third of these teachers consider themselves prepared to use computers and the Internet in their instruction. To this matter, Lumpkin & Clay (2001) suggest, “that teacher readiness hinges on more funding, technology training, and administrator support for instructional technology.”
Sheldon & Jones (1996) say that the critical factors in the integration of technology in schools include time, training, technology, and teacher-type tasks. These are some barriers that universities and colleges with teacher preparation programs should work to eliminate and focus their attention on technology-enhanced learning (Lumpkin & Clay, 2001). Rizza (2000) reported that the comfort levels with technology of preservice teachers along with their feelings of competence have improved over time. Yet, perception of their knowledge has remained constant (Jones, 2001). At least partially, universities and colleges are responsible for not preparing preservice and inservice teachers to effectively integrate technology into their teaching to enhance student learning (Brooks & Koop, 1989).

Thus, unless university faculty find value in using technology in their learning and consequently teaching, traditional instruction may permeate colleges and teacher preparation programs (Vojtek & Vojtek, 2000). Therefore, lack of equipment, time (Sammons, 1994; Solomon, 1994), knowledge and skills (Kerr, 1990), and perceived value they all exist as barriers to the integration of technology into teacher preparation and advanced teacher education programs (Lumpkin & Clay, 2001; Hill & Somers, 1996). Beyerbach, Walsh, & Vannatta (2001) and, Clark, Martin & Hall (2000) have reported on strategies to better prepare preservice teachers to confidently and competently infuse technology into their instruction. As schools and colleges of education have improved their instruction and modeling of technologically enriched programs of study, their graduates have joined schools classrooms with a better perspective in their ability to use technology as an effective instructional tool (Lumpkin & Clay, 2001).
Technology in Regular Education

During the past few years, technology has become a central focus of the curriculum (Jones, 2001; Lumpkin & Clay, 2001; Smith, 2000) and a welcomed tool to address various learning styles, assessments, instructional strategies, and other classroom practices (Bolinger, 1999). In general, subject area curricula present instances of student involvement with technology. An example of this is: the use of spreadsheets for math problem solving; computer probes for science measurements and analysis; online capabilities for social studies projects; computer drawing and animation in art; multiple databases from the media center; and multimedia projects with graphics, text, and sound for language arts projects. These and scores of other technology uses have enhanced the faculty's capability to engage active learners and help them make personal connections with the subject matter (Bitner & Bitner, 2002). As we know from research, these experiences help students to learn and remember the concepts being taught (Waxman, Connell, & Gray, 2002). Flexible block schedule allows technology experiences to occur more readily in longer periods of instruction (Bolinger, 1999).

There are many ways to integrate technology in the curriculum. “Fullan (1982, p. 107) a renowned expert in change theory in education stated that educational change depends on what the teachers do and think.... It's as simple and complex as that” (Bitner & Bitner, 2002). There is no doubt that before technology can exercise changes in teaching or learning, teachers need to learn how to use technology and also be open to, if necessary, change their teaching paradigm (Bitner & Bitner, 2002).

Computers are by any means the teaching machines they were thought
of when first conceived. Today, educators look to computers for support in their instruction (Farnsworth, Shaba, & Bahr, 2002). Allen (2001) says that rapid growth and changes in technology exceeds today's understanding of how should professionals use technology in the classroom. And, Waxman, Connell, & Gray (2002) in the NCREL synthesis of recent research in this area, suggest that this technology impact is not the same from that taken place years ago.

Today, computers can aid instruction and paperwork to ease the professional practice. Teachers can use computers to "manage data, reinforce instructional concepts, act as resources for information in a random learning environment, promote multimedia concept learning that address multiple learning modes, and deliver on demand learning programs over multiple types of e-systems" (Farnsworth & Wilkinson, 1987; Shaw & Farnsworth, 1993) to name a few of the still current and potential uses. It is important to mention that there is a continuous change in the use of computers as technology advances and new applications are created (Mize, 2000; Yildirim, 2000) or current applications are enhanced.

A strong support system composed of faculty and administrators at both the universities and schools systems would be a good combination to improve teacher readiness to use technology (Jones, 2001). Technology is a powerful tool in the teaching-learning process. When appropriately used, it can help students in their school life develop the skills, knowledge and insight necessary to learn contents, have positive experiences and make a successful transition to the world beyond school (Thomas & Sullivan, 1998). Furthermore, McKinnon, Nolan & Sinclair (2000), in their longitudinal study
on attitudes toward computers, say "computers tend to motivate students, lead to positive attitudes towards both computers and schooling, an enhance students' prospects for employment when they leave school. Most of the literature research in instructional technology concentrates on hardware and software and not directly the teaching and learning, critical areas of practice and pedagogy (Tomei, 2002).

There are two courses involved in this study, one related to regular education, and the other to special education. They have their goals set on preparing teachers to use technology as an instructional tool. The course related to the regular education program is the EDT 347 – Technology for Elementary Education (see Appendix E). This course was designed for those with no prior experience with computers. The main goal for all three semesters presents a slight variation in the language but not to the content. This goal as outlined in the syllabus is,

The general goal of EDT 347 is to familiarize undergraduate students studying elementary education with the technologies that are used in many of today's elementary education classrooms. The course will introduce students to several basic computer applications and require that each student demonstrate their competency in using the applications as part of class communications and as part of class assignments. The major components of the class include creating lesson plans that integrate technology into academic subjects using Michigan
Academic Benchmark Standards and ISTE Technology Standards for Teachers. These assignments will require use of the TaskStream online lesson planning tool. Another major component of the class is creating a web-based portfolio that will include a home page, resume page, personal page, technology competencies page, and a major/minor page. The final component of the course is the development of a collaborative ThinkQuest professional development or K-8 subject area site for integrating technology into elementary education. Students will work in teams to complete this last assignment. (EDT 347. Syllabus, Fall 2001).

This course’s competencies for students are based on ISTE 2000 Technology Standards. These competencies present slight variation between semesters; sometimes they have a name change maintaining the expectations in terms of content and compliance. Thus, these variations are not of great importance for the purpose of this study. The competencies are presented here as outlined in the syllabus of one of the courses in the regular education teacher preparation program: (I) Using Email, (II) Using a Web-based Course Management System, (III) Using the Internet, (IV) Creating Desktop Presentations, (V) Creating a Spreadsheet, (VI) Web Page Authoring, (VII) Desktop Publishing, (VIII) Use of the Inspiration Planning Tools, (IX) Integration of Technology into Lesson Plans, (X) ThinkQuest Web Site Development, (XI) Hands-on Experience Using Instructional Technology.
Equipment, (XII) Independent Learning Experience Using the SmartForce Training Systems (EDT 347. Syllabus, Fall 2002). The semester of Fall 2002 was the only one to add the XII competency to the syllabus.

The information provided on the introductory technology course in the regular education teacher preparation program provides a general idea for the expectations of the course, its content and its assignments presented to the students participating in the semester. This information is of common grounds for all three semesters considered for this research study.

Technology in Special Education

Students having exceptionalities may exhibit a variety of learning needs, and sometimes in a group of students with special needs, we, as teachers do not find commonality among their needs (Belson, 2003). According to the National Information Center for Children and Youth with Disabilities (NICHCY), five million U.S. children receive some sort of special education services each year (NICHCY, 1999). Technology provides different learning opportunities to students with special needs. However, technology choices should follow the same principles that guide other instructional choices. Professionals working with this population should assess all available resources to be able to choose which one matches best the learning needs of the student. The challenge is to be creative, flexible and efficient when choosing instructional techniques, including the use of technology in our daily teaching practice (Belson, 2003).

When we think of individuals with disabilities, we often think in terms of assistive technology and/or adaptive technology. These technologies can be anything from wheelchairs to computer systems, especially designed to
meet the needs of a particular individual. It seems necessary to define assistive technology and adaptive technology.

§300.5 Assistive technology device. An assistive technology device means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability” (IDEA 97).

Assistive technology service means any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device (IDEA 97). Adaptive technology, on the other hand, modifies traditional tools, such as a shoulder rest that makes the telephone receiver easier to hold (Belson, 2003).

In special education, IDEA 97 dictates how technology is considered when services are provided to individuals with disabilities. It also relates to the conditions on how that technology is going to be available for that particular individual.

§300.308 of IDEA 97 final regulations has been amended to clarify that, on a case-by-case basis, the use of school-purchased assistive technology devices in a child's home or in other settings is required if the child's Individualized Education Plan (IEP) team determines that the child needs to have access to those devices in order to receive Free Appropriate Public
Education (FAPE). The assistive technology devices that are necessary to ensure FAPE must be provided at no cost to the parents, and the parents cannot be charged for normal use, and wear and tear. However, while ownership of the device in these circumstances would remain with the public agency, State law, rather than Part B of IDEA, generally would govern whether parents are liable for loss, theft, or damage due to negligence or misuse of publicly owned equipment used at home or in other settings in accordance with a child's IEP (IDEA 97).

The third course related to this research study is SPED 537 - Technology in Special Education. In order to become familiar with the course information taken from the course syllabus is provided by the researcher, This course is designed to provide specific information, exposure, and experience related to a variety of ways that current and emerging technologies may be used to improve the education and lives of learners with disabilities. The Special Education Undergraduate Programs will prepare students to:

(1) Work effectively with parents. (2) Use interdisciplinary communication skills associated with a teacher consultant role.
(3) Provide quality educational services to students with disabilities in the state, region, and nation. (4) Implement the
Clinical Teaching Model in their educational programs serving students with disabilities. (5) Function as a resource for regular educators serving students with disabilities. (6) Serve as a resource for parents/guardians of students with disabilities. (7) Serve as advocates for students with disabilities in our society. (8) Function as professionals in the field of education. (9) Be critical consumers of current and emerging educational techniques and technologies. And, (10) To demonstrate knowledge regarding the issues and needs of traditionally underrepresented populations. (SPED 537. Syllabus, Fall 2001).

There is a list of competencies for students who participate in this course. This course was offered to undergraduate and graduate students, thus it is addressed to Undergraduate Special Education, and the Clinical Teacher. The competencies for the course are taken from the CEC Common Core of Knowledge and Skills. The major areas for the competencies are presented here as listed in the syllabus (see Appendix F).

I. PHILOSOPHICAL, HISTORICAL, AND LEGAL FOUNDATIONS OF SPECIAL EDUCATION.

II. CHARACTERISTICS OF LEARNERS.

III. ASSESSMENT, DIAGNOSIS, AND EVALUATION.

IV. INSTRUCTIONAL CONTENT AND PRACTICE.

V. PLANNING AND MANAGING THE TEACHING AND
Surveys

Surveys are tools to collect information from a sample of the population. They could take the form of a questionnaire or an interview depending on the information that is sought after (Marshall & Rossman, 1999). Although there are limitations related to the objectivity to the data collected, in many studies this limitation is outweighed by the advantages provided (References). Advantages include being able to collect information from a selected sample in order to generalize about characteristics of a large population. Also, the use of standardized items with all surveyed participants allows for opportunities to determine internal validity (Schloss & Smith, 1999).

Web-based Surveys

Research data collection via Web-based surveys is growing in popularity and is proving to have a variety of advantages. Surveys presented in an on-line format are convenient for both the researcher and the
respondent. These surveys also provide a relatively rapid, inexpensive, and efficient means of collecting data from large population samples. Additionally, collecting data in electronic formats eliminates the need to code, or otherwise prepare data for analysis (Perkins & Yuan, 2001; Mertler, 2002).

The literature, however, also points out a number of concerns with Internet or Web-based surveys that need to be addressed. These include, “the need for informed consent, easy withdrawal from the study, data security; generalization of the samples to an entire population, and validation or other comparison studies that address the possibility of subjects being more heterogeneous than typical paper-and-pencil recruits” (Perkins & Yuan, 2001, p. 369).

Concerning the reliability of web-based surveys, a study of results from research using web-based surveys (Mertler, 2002) revealed no significant differences in survey responses based on method of presentation, i.e., paper-and-pencil versus web-based. Perkins and Yuan (2002) have reported similar findings, they express that web-based surveys have a better response rate than pencil-and-paper surveys. However, Matz (as cited in Mertler, 2002), have found that response rate was the only area considered that indicated a significant difference, with paper surveys having a higher response rate than web-based. It was also noted that there were no gender differences found among the respondents. The advantages of Web-based surveys already have been mentioned, although, not the least of which is ease of administration, data collection, and data analysis (Davis, 1999). At least the housing of the survey, the data collection and its security is been managed by systems in the Web that offer researchers this type of collaboration.
Educational Technology Profiler Survey (ETPS)

Dr. Robert Leneway, Director of the PT³ - Collaborative Learning & Teaching Through Technology Project (PT³-CLT³), in collaboration with other members of the grant, designed the Educational Technology Profiler Survey (ETPS) in the year the project took off. It is based on the six ISTE-NETS Standards. The original version of ETPS has 48 items reflecting the six standards (see Appendix D). The ETPS survey had been used through three semesters Fall 1999, Winter and Fall of 2000. It was designed to collect information related to the technology skills of students participating in the EDT 347 – Technology for Elementary Education, in the College of Education at Western Michigan University (R. Leneway, M. J. Mielke, H, Poole, personal conversation, February 19, 2003). For the Winter semester of 2001, the ETPS survey was revised and modified by Dr. Howard Poole and the author. The new version of the ETPS included a total of 40 items, 35 of them still reflected the six major ISTE standards, and a section on assistive technology was added to complete the 40 items (see Appendix D). This version of the ETPS has been used since the winter semester of 2001 up-to-date. The assistive technology section was added to include information related to the special education teacher preparation program in the same college. Another reason to modify the survey was to improve the correspondence between activities and assignments in the course with the ISTE standards (H. Poole, personal conversation, February 13, 2003).

The distribution of the 48 items by standard, for the original version of the Educational Technology Profiler Survey (ETPS), is as follows. Standard I, Items 1-7; Standard II, Items 8-12; Standard III, Items 13-19; Standard IV,
Items 20-32; Standard V, Items 33-38; and, Standard VI, Items 30-43. The
distribution of the 40 items by standard, for the revised version of the
Educational Technology Profiler Survey, is as follows. Standard I, Items 1-6;
Standard II, Items 7-12; Standard III, Items 13-18; Standard IV, Items 19-24;
Standard V, Items 25-30; Standard VI, Items 31-35; and, Section AT, Items 36-
40.

The survey has been administered in on-campus, as well as off-campus
sections of the EDT 347 course; other courses, not related to the CLT³ project,
in the same college have used the survey for the purpose of letting students
find their technology skills level. In addition, it has been used with mentor-,
and intern-teachers in the field to create a baseline of their technology skills. It
was also used with part-time faculty at the university to find their technology
skills level (M. J. Mielke, personal conversation, February 17, 2003). Two
other institutions outside of Western Michigan University have used the
revised version of the ETPS, Friends University, and Madonna University.
Madonna is the only one that has reported data from using the survey (P.
Haack, personal conversation, July 31, 2002).

Profiler System

Profiler is an online collaboration tool provided by the High Plains
Regional Technology in Education Consortium (HPR*TEC). Profiler helps
groups of individuals find and improve their skills around a topic by
stimulating cooperation and collaboration. Profiler is designed to assist a
learning community supporting interaction, facilitating communication, and
sharing resources among all users. Users can track their results over time and
compare their improvements (Profiler, 2002).
This is the system that houses the ETPS for the PT³-CLT³ project at Western Michigan University. This is the system that participants have to access in order to complete the survey. Every time participants take the survey the date and time is stamped when it has been taken. This feature in the site has been particularly beneficial for the purpose of this study because times can be identified for the researcher to consider the results for the eventual statistical analysis.

Course Management System

It is necessary to comment on course management systems since the courses participating in this research study used this as their way to keep records, post students' grades, and communicate with the students in the course. The sections of the courses during semesters Fall 2001, and Winter 2002 used the Blackboard Management system to administer the course. The section during the semester of Fall 2002 used the WebCT management system as the one to help instructors manage the course.

Blackboard System

Blackboard.com is a free course Web site creation service that enables instructors to add an online component to traditional classes or teach an entire course on the Web. It is a management system that allows instructors to have a complete control of the course online. It is a very convenient tool for both the instructor and the students in the course because it provides access to all information related to the course (i.e., syllabus, assignments, readings, grades, etc.). It also provides means of communication between the instructors and the students (Blackboard, 2002). Records on all different
aspects of the courses were stored in, and managed through the Blackboard system. For the purpose of this study, information on academic performance for all participants was collected from the Blackboard system for the researcher for the eventual statistical analysis.

WebCT System

WebCT.com, the e-Learning hub, is the other course management system used by instructors of the courses involved in this study. WebCT contains teaching and learning resources that instructors, designated as designers, can use in the teaching process. It also offers access to a community of other users across its platform including courses and disciplines. Within these communities, designers and students can share information, ideas, goals, and WebCT resources. WebCT.com has discipline-specific communities, as well as areas that focus on general topics, all of which support teaching and learning for designers and students alike. (WebCT, 2003). Records on all different aspects of the course were stored in, and managed through the WebCT system. For the purpose of this study, information on academic performance for all participants was collected from the WebCT system for the researcher for later statistical analysis.

Teaching Technology Skills and Computer Skills

In order for teachers to effectively integrate technology into their instructional strategies they must first develop skill in various forms of technology and knowledge of instructional theory, as it all relates to technology (Brown, 2000; Castellani, 1999; CEO Forum, 2001; King, 1999; Smith, 2000). To assure that teachers are adequately prepared to integrate
technology into their instructional practice and facilitate student access to technology, educators need not only to become proficient in available hardware and software, they also need to be provided with training in the instructional uses of technology (Castellani, 1999; CEO Forum, 2001; King, 1999).

One study conducted by the U.S. Department of Education (as cited in Anderson, 2000) found that only 20% of 3,560 teachers surveyed felt confident in their preparation to use computers in their classroom. Another survey of 6,000 teachers and principals, conducted in 1998, found that only about half had participated in formal technology training and that the training they received had focused primarily on how to use specific types of technology, rather than how to incorporate technology into their pedagogy (Anderson, 2000).

Training teachers to use technology as an educational tool involves more than increasing personal skill with computers and other multimedia devices. A study conducted by King (1999), on teachers and teachers-in-training enrolled in a graduate level course on technology applications in the classroom, found students were most likely to have positive changes in their personal perspectives toward using technology for instruction when they were given "hands-on" learning experiences. Opportunities to engage in critical thinking and collaborative discussions were also found to have a positive impact. Participants in the same study stated that the focus on applications of technology for learning had resulted in a shift in their instructional practice from a teacher-centered to a more learner-centered approach. In addition, participants affirmed they had developed more
confidence in their abilities and had begun using technology to research information and for preparing materials for instruction. This study also suggests the need for universities to “respond to the technology needs of teachers by building a background in educational technology theory, use, and related issues” (King, 1999, p. 23).

Demonstrating technology skills competencies is a new area in teacher preparation programs, as well as licensure (Ballard, 2000). One of the important elements is for preservice teachers to see technology a tool to instruction not as the mean of it (Ballard, 2000; Brush, Glasewski, & Rutowski, 2003; Clark, Martin, & Hall, 2000). Thus, as computers proliferate in the classrooms teachers need to know what to do with them, how to use them effectively and how to take advantage of them for the benefit of the students. (Clark, Martin, & Hall, 2000). However, many professionals in the field lack the skills or perhaps the confidence in their skills, with this new digital tool (Ballard, 2000). This is when teacher preparation programs have the responsibility to prepare students in the use of technology, and do so following established standards, i.e. NCATE, ISTE-NETS. Professionals sometimes find that the private sector provides training in productivity tools where they show good experience but lack ways to integrate those tools in the teaching-learning process (Ballard, 2000).

Education Majors and Gender

In relation to the major of study, the researcher refers to both teacher preparation programs at this university, regular elementary education and special education. The elementary education curriculum is a program designed to prepare students to assume their teaching responsibilities in a K-
8 grade classroom, as it is presented in the WMU Undergraduate Catalog (2001-2003). In this program there is a variety of areas as a primary or secondary emphasis, also mentioned in this study as major and minor. Students in this program have a set of requirements that cover general education as well as major or minor curricula approved for elementary education. Among these requirements students have to complete hours in the general education foundations, hours in the professional education program and other requirements on university intellectual skills in reading, quantification, writing, college writing, baccalaureate writing, and computer literacy must be met.

In the College of Education at WMU, students in the regular education teacher preparation program apply to the special education teacher preparation program. Each year, the Department of Educational Studies establishes the maximum number of new students who can be admitted to each of the Special Education curricular areas (emotional impairments, mental impairments, and visual impairments) for the following year. A departmental faculty committee responsible for the undergraduate admissions reviews all applications during the month of January and selects students into the Professional Education Curriculum in Special Education. Minimum criteria for admission include:

- Completion of 56 hours (winter semester hours may be counted)

- Completion of all Western Michigan University Intellectual Skills Development requirements (e.g. MATH 109, ED 104,
ENG 100, if required)

• Completion of an approved college level writing course

• Completion of ED 250, Human Development, or an approved course with a grade of "C" or better

• Achievement of a minimum cumulative grade point average (GPA) of 2.5 or better at the time of application

• Achievement of acceptable scores on the Michigan Test for Teacher Certification (MTTC) - Basic Skills section at the time of application

• Documentation of thirty clock hours of experience with person(s) with a disability

• Documentation of current TB test

• Completion and submission of College of Education application for admission by January 15 to the Office of Admissions and Advising, 2504 Sangren Hall.

Students' completed applications are evaluated using the following specific criteria:

• 40% weighting based on grade point average at the time of application
• 30% weighting based on performance on the Michigan Basic Skills Test (state required literacy test in Reading, Writing, and Mathematics)

• 10% weighting each for semester hours completed, under-represented group membership, and other criteria.

The information on the admission process intends to provide a general idea of the type of students who join the special education teacher preparation program. These students already meet a grade point average required by the Department, thus putting them in an advantageous kind of situation in relation to their peers in general elementary education program. There is also a set of requirements that must be met similar to those in the elementary education program. University general education, baccalaureate writing, academic minor, chosen from those approved for the special education program, an endorsement major, chosen from the ones offered by the Department, and hours from elective courses if needed to complete the total number of hours for the degree.

In relation to gender, there are differences of opinion among authors. Kimura (2002) in her study in sex differences in the brain, posts interesting questions, i.e. are there differences in intellectual function between men and women? Sex differences in problem solving are some of the situations studied in a laboratory setting. Among the results of studies presented by Kimura, on average, men perform better than women at certain spatial tasks. However, the average sex differences in cognition vary from slight to quite large and that men and women overlap enormously on many cognitive tests that show
average differences. On the whole, variation between genders tend to be smaller than differences within each sex, but very large differences between the groups exist, specifically for men and their visual-spatial targeting ability.

Another study presented by Kimura (2002) found that men completed a computer simulation of a maze or labyrinth task more quickly and having less error than women did. An study by different researchers dealing with route learning showed that men learn routes in fewer trials and with fewer errors, while women remembered more of the landmarks, such as buildings facade, than men did. Results from these studies suggest that women tend to use landmarks as a strategy to orient themselves in everyday life more than men do (Kimura, 2002).

Other studies gender-based like Sadker & Sadker (as cited in Crombie, Pyke & Silverthorn, 2003) state that classroom participation is deemed by students, male and female, to be related to effective learning and to result in more positive views of the learning experience in their college life. In another study on the same topic referred by Crombie, Pyke & Silverthorn (2003) done by Krupnick (1985), in which classes were videotaped, males were found to dominate classroom discussions, particularly in classes with male instructors and a majority of male students. In terms of accessing the Web, Margolis and Fischer (2002) state "At the turn of the century, women are surfing the web in equal proportion to men" (p. 2).

Other studies also reported by Crombie, et al, (2003) have also convey that there is some preliminary support for the suggestion that female students may be more affected by characteristics of the university classroom, such as class composition and size, than are male students. Based on the findings in
these studies, female students as compared with male students would perceive themselves as participating less overall, using less assertive modes of participation, participating more in classes taught by female faculty, and having more positive perceptions of female professors (Crombie, Pyke & Silverthorn, 2003).

In studies related to attitude towards computers among teacher education students, Khine (2001) in his study found that males have higher confidence in using, and low anxiety toward the use of computers. Female students show higher anxiety toward the use of the computer when compared to their male counterparts. As noted from the different studies presented in this section, there are a variety of opinions in relation to technology and gender. From what has been gathered one cannot conclude that males perform better than females, or vice versa.

Validity and Reliability Studies

Consideration of the validity and reliability of the instrument used in survey research is important in establishing the efficacy of a study (Millington, Leierer, & Abadie, 2000; Schloss & Smith, 1999; Woodrow, 1991). The term validity, as it applies to survey research, can be simply described as the degree to which the instrument "measures what is purported to be measured" (Schloss & Smith, 1999, p.112). Whereas, reliability can best be described as "the extent to which an instrument provides consistent results." (Schloss & Smith, 1999, p. 113). In order to assure that these aspects of survey research are adequately addressed it is imperative the researcher provides a clear description of the relationship of validity and reliability to the study and a rationale for the statistical tests used in the analysis of each of these factors.
An examination of the term validity indicates various sub-categories that should be considered. The three main sub-categories include construct validity, content validity, and predictive validity. Predictive validity may also be referred to as criterion-related validity (Millington, Leierer, & Abadie, 2000). In addition, researchers may also choose to assess concurrent validity that compares outcomes of a survey to a different but related survey to determine consistencies of responses (Schloss & Smith, 1999).

Construct validity is particularly important for surveys that are used to collect data that relates to characteristics that are not observable or that are subjective in nature. The collected data is then compared to direct measures of observable behaviors that have been established as representative of the unobservable characteristics. Construct validity is dependent on the use of sound theory or establish set of criteria and can help to further establish the value of such (Millington, Leierer, & Abadie, 2000; Schloss & Smith, 1999). Construct validity of an instrument is also dependent on its content validity (Jones & Pearson, 1996).

Content validity indicates the extent to which specific survey items can be directly associated with a reliable theoretical framework and/or established set of criteria (Jones & Pearson, 1996; Schloss & Smith, 1999). The primary concern of content validity is to assure that the instrument is designed in such a way that it efficiently addresses the essential components of the theory or criteria that underlies the investigation (Millington, Leierer, & Abadie, 2000). This is best accomplished by items that are carefully worded and require objective, rather than subjective, responses (Jones & Pearson, 1996). When it is necessary to gather responses that are more
subjective in nature (i.e., attitudes or perceptions) a test of predictive validity becomes increasingly important (Jones & Pearson, 1996; Millington, Leierer, & Abadie, 2000; Schloss & Smith, 1999).

Predictive validity, or criterion-related validity, relates to the instruments capacity to anticipate likely outcomes of specific targeted criteria. Pedhazur & Schmelkin explain this type of validity in the following way: “By judging the power of the instrument to predict the outcome, criterion-related validity is the ultimate arbiter of utility” (as cited in Millington, Leierer, & Abadie, 2000, p. 39). Predictive validity, therefore, has particular importance to both the researcher and to the practitioner who may be using the survey to collect data to help guide the focus of instruction in a course. Whatever types are explored, however, validity should be considered “a unified concept” (Millington, Leierer, & Abadie, 2000, p. 39) with the synthesis of the different types of validity providing an indication of the value of an instrument.

Validity and reliability, both important considerations in measurement error (Schloss & Smith, 1999), have an underlying relationship (Jones & Pearson, 1996), but there are some important differences in these factors. A test of reliability of an instrument provides information as to the consistency of the results obtained. “Thus, when an instrument is reliable, differences in results can be attributed to actual differences in respondents rather than to random causes” (Jones & Pearson, 1996, p. 18). Therefore, it becomes apparent that reliability is an extremely important factor that can affect validity and analysis of findings (Jones & Pearson, 1996; Woodrow, 1991).

The reliability of an instrument can be determined using a variety of approaches. These can include test-retest, equivalent forms, internal
consistency, and inter-observer agreement (Schloss & Smith, 1999). The majority of the studies assessing reliability of their instruments have done so through the standard coefficient of internal consistency, i.e., Cronbach's alpha level. Only in rare cases have other methods been used to verify reliability of measures. Specifically, 2% used test/retest, 2% used split halves, and 21% used inter-coder tests, such as the validation statistics reported for our study. Moreover, the use of more than one reliability method occurred in 13% of the studies assessing reliability (Boudreau, Gefen & Straub, 2001). The absence of gender-difference in respondents is somewhat surprising considering the findings of Temple and Lips, and Shashaani (as cited in Huang, 2002) that report men have higher "comfort and confidence with computers than female" and that men were "more experience in computer skills than female (Huang, 2002, p. 410)."

An examination of recent literature dealing with the consideration of validity and reliability in survey research provides some examples of the importance attached to these factors. One study, that focused on how the consideration of validity of a particular instrument "advanced both theory and instrumentation" (Millington, Leierer, & Abadie, 2000, p. 39), concluded that validity is "intrinsic to the development of an instrument" (p. 45) and seeking to assure validity in an instrument "strengthens theory, measurement, design, and analysis" (p. 45).

Another study (Jones & Pearson, 1996) included an examination of convergent validity by looking at relationships of responses on two instruments, one objective and one subjective that intended to measure computer literacy scores. The objective instrument, which was the focus of
the study, had been determined to have content validity due to the fact that it was directly tied to the topic and had clearly worded items. A comparison to the related subjective instrument, which had been show in previous studies to be highly reliable and valid, indicated a strong correlation, supporting the construct validity of the objective instrument under study.

An analysis of four separate instruments designed to measure attitudes toward computers (Woodrow, 1991) considered the reliability of each instrument as a means of supporting the validity of each. The researcher contends that the reliability and, thus the validity of these surveys strengthened the positive correlations found.

Summary

This chapter has presented an introduction to the role of technology in education. The chapter built on background information to help the reader situate him or herself in the context where this research study is taking place. A review of the literature addressing the different aspects related to technology and education has been presented. The researcher made special efforts to relate information to the PT³ Grant and the PT³-CLT³ Project, which is an important element in the course of this study.

Information has been also provided on aspects related to the standards in education and in technology. On the same token, technology relative to the general elementary education and the special education fields has been presented in order to create a context for the reader. The systems used to manage the courses as well as the surveys related to this study have also been mentioned. The last section of the chapter has covered information relative to teaching technology skills, education majors, and gender, closing.
with validity and reliability studies that in some cases resemble the context of this study.

Chapter III will present the methodology proposed for this study with all the elements pertinent to the collection and analysis of the data.
CHAPTER III

METHODOLOGY

Introduction

This chapter will provide information on the proposed methodology that will be employed to address the research questions mentioned above. This chapter addresses: 1) institutional setting, 2) subjects in the study, 3) description of the dependent and independent variables with a brief introduction, 4) data collection procedures, 5) description of the data analysis with an introduction and each of the hypothesis tested including the null hypotheses.

The proposed research questions are:

Is there a relationship between academic performance and the technology skills of students in the introductory technology courses in teacher preparation programs at Western Michigan University?

Is there an interaction between education major and gender on the academic performance of students from introductory technology courses in teacher preparation programs at Western Michigan University?

Institutional Setting

Western Michigan University is a student-centered research university. It is one of only 102 public universities placed in the highest category of doctoral-research universities by the Carnegie Foundation for the
Advancement of Teaching -- "Doctoral/Research Universities-Extensive"
(WMU website, 2003). WMU has an enrollment of approximately 30,000 students. Western has eleven academic units. These units are The Lee Honors College, The Graduate College, College of Arts and Sciences, College of Aviation, Haworth College of Business, College of Education, College of Engineering and Applied Sciences, College of Fine Arts, College of Health and Human Services, Extended University Programs and The Division of Multicultural Affairs.

The College of Education includes the departments of Counselor Education & Counselor Psychology; Educational Studies; Family & Consumer Sciences; Health, Physical Education and Recreation; Teaching, Learning & Leadership; Distance Education; and, General University Studies. The College of Education also houses the PT³ - CLT³ project previously presented in chapter II. This project developed the Educational Technology Profiler Survey – ETPS (see Appendix D). The ETPS survey was designed to measure the level of technology skills of students in introductory technology courses in the teacher preparation programs at WMU.

The PT³-CLT³ project is linked to two introductory technology courses. EDT 347 – Technology for Elementary Education, housed in the Department of Teaching, Learning & Leadership; and, SPED 537 - Technology in Special Education in the Special Education Program, housed in the Department of Educational Studies. A description provided for the courses as presented in the WMU Undergraduate Catalog (2001-2003) follows,

[EDT 347 Technology for Elementary Education] An introduction to the contributions of instructional technology to learning and
teaching in elementary education. The course will provide a survey of critical use of technology appropriate for elementary education and will enable students to acquire basic skills in producing and using computers, video, and other instructional technologies in educational applications (p. 177).

Table 1. Assignments required in EDT 347. Fall 2001, Winter and Fall 2002.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Fall 2001</th>
<th>Winter 2002</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Divide Paper</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PowerPoint</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Computer Operations</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lesson Plan A</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dreamweaver Training</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Electronic Portfolio A</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Electronic Portfolio B</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Midterm Test</td>
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<td></td>
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<tr>
<td>Excel Training</td>
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<td></td>
<td>X</td>
</tr>
<tr>
<td>Lesson Plan B</td>
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<table>
<thead>
<tr>
<th>Assignment (continue)</th>
<th>Fall 2001</th>
<th>Winter 2002</th>
<th>Fall 2002</th>
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<tbody>
<tr>
<td>Lesson Plan C</td>
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<td>Microsoft Publisher (Newsletter)</td>
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<td>Web Site Evaluation</td>
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<td>ThinkQuest Project A</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>ThinkQuest Project B</td>
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<tr>
<td>Computer Operations Quiz</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Library/Media Center Quiz</td>
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<td>Assistive Technology Quiz</td>
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<tr>
<td>Computer Labs Quiz</td>
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<td>Field Trips-Distance Learning Quiz</td>
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<td>X</td>
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<tr>
<td>Hand Held Devices</td>
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<td></td>
<td>X</td>
</tr>
<tr>
<td>Total Points</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

[SPED 537 Technology in Special Education] "This course is designed to provide specific information, exposure, and experience related to a variety of ways that current and emerging technologies can improve the education and lives of learners with disabilities."
Tables 1 and 2 list the various measures of academic achievement used in EDT 347 and SPED 537. As part of this research study, the researcher is seeking to determine whether the information obtained using the ETPS (see Appendix D) accurately and appropriately reflects the technology skill level of students as measured by the academic achievement items used by the instructors. The technology skill level of the students will be determined from the nature of the final products submitted to the instructors. The scores for the assignments reflect the specified criteria as presented in the syllabi for the

Table 2. Assignments required in SPED 537. Fall 2001.

<table>
<thead>
<tr>
<th>Assignments</th>
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<tr>
<td>Blackboard &amp; Profiler</td>
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<td>Definition of Education Technology</td>
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<td>E-Greeting Card</td>
<td>X</td>
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<tr>
<td>Computer Hardware Assignment</td>
<td>X</td>
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<tr>
<td>Journal Article Presentations</td>
<td>X</td>
</tr>
<tr>
<td>KeeBooks</td>
<td>X</td>
</tr>
<tr>
<td>Software Evaluation</td>
<td>X</td>
</tr>
</tbody>
</table>
Assignments (continue)                     Fall 2001

Database                                    X

Power Point                                 X

AT on the Web                                X

Midterm Exam                                X

HyperStudio Presentation                    X

Electronic Portfolio                        X

FINAL EXAM                                  X

introductory technology courses (see Tables 1 and 2). Thus, academic performance is measured through the grade points assigned to each student product.

For a better understanding of the context of this research study, the researcher presents a description of the relationship between EDT 347 and the assignments in both sections of this course involved in the study (see Table 3). There are three types of assignments in EDT347: 1) multiple-choice quizzes, 2) product assignments, and 3) tutorials.

There are six quiz assignments: Computer Operations Quiz, Library/Media Center Quiz, Assistive Technology Quiz, Computer Labs Quiz, Fieldtrips-Distance Learning Quiz, and Handheld Devices Quiz. The quizzes are created in the course management system and the scores are automatically posted to the students' grade book. Scores for the quizzes range from zero
Table 3. Relationships between Assignments and ETPS in EDT 347. Winter and Fall 2002.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Winter 2002</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>ETPS Item</td>
</tr>
<tr>
<td>Digital Divide</td>
<td>VI</td>
<td>31</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>II, V</td>
<td>7, 27</td>
</tr>
<tr>
<td>Computer Operations</td>
<td>I</td>
<td>5, 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Operations Quiz</td>
<td>I, IV, VI, AT</td>
<td>1, 2, 3, 4, 5, 6,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21, 33, 34, 36,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38, 39, 40</td>
</tr>
<tr>
<td>Lesson Plan A</td>
<td>II, III, IV, AT</td>
<td>10, 11, 12, 15,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17, 18, 19, 20,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Dreamweaver Training</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Electronic Portfolio A</td>
<td>I, II, V</td>
<td>3, 9, 25, 27, 28</td>
</tr>
<tr>
<td>Electronic Portfolio B</td>
<td>I, II, V</td>
<td>3, 9, 25, 27, 28</td>
</tr>
<tr>
<td>Midterm Test</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Excel Training</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Lesson Plan B</td>
<td>II, III, IV</td>
<td>10, 12, 13, 15,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20, 22</td>
</tr>
<tr>
<td>Lesson Plan C</td>
<td>II, III, IV, V</td>
<td>10, 12, 15, 16,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17, 20, 26</td>
</tr>
<tr>
<td>ThinkQuest Project A</td>
<td>II, III, V</td>
<td>9, 11, 14, 17, 26</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Assignment (continue)</th>
<th>Winter 2002</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>ETPS Item</td>
</tr>
<tr>
<td>ThinkQuest Project B</td>
<td>II, III, V</td>
<td>9, 11, 14, 17, 26</td>
</tr>
<tr>
<td>Microsoft Publisher</td>
<td>V</td>
<td>29</td>
</tr>
<tr>
<td>(Newsletter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web Site Evaluation</td>
<td>IV</td>
<td>19</td>
</tr>
<tr>
<td>Library/Media Center Quiz</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Assistive Technology</td>
<td>VI, AT</td>
<td>33, 36, 37, 38, 39, 40</td>
</tr>
<tr>
<td>Computer Labs Quiz</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Field Trips-Distance</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Learning Quiz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand Held Devices</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

(did not take quiz) to 25 points or 100% correct. All the quizzes have five questions with each question worth 20%.

There are several types of product assignments. Each product assignment has a descriptive checklist that needs to be completed by the student as well as a rubric for determining grades. Students who create poor products that lack required items or are poorly constructed are given one or more remedial opportunities to complete the assignment. Because of the remedial nature of the grading most students are able to obtain perfect scores from mediating their work.

One product assignment, a paper about the "Digital Divide", is a short (less than two pages) essay on the topic that is created and then emailed to the instructor for grading. A second product assignment is a PowerPoint
Presentation of less than eight slides that need to be created and then transferred via email or electronic drop box to the instructor for grading. Three of the assignments use the TaskStream Lesson Planning tool to create lesson plans that integrate the use of technology. Students use the tool to create a comprehensive lesson plan, to attach example student products and worksheets, and to attach grading rubrics. The TaskStream Tool allows instructors to make comments regarding various elements of the lesson plan and to assign grades based on work completed. The three lesson plans include 1) using Internet web sites, 2) using Excel for student data collection, and 3) using distance learning or virtual fieldtrips. Students also use Microsoft Publisher to create a newsletter product. The final newsletter is emailed to the instructor or placed in a drop box for grading.

Two additional product assignments require the students to create web pages and then to install the web pages on an Internet server. Each of these two assignments is divided into two parts. The first part requires the student to register for an Internet server provider and to transfer a basic set of pages to the server. Part A for each assignment is graded on a pass-fail basis. Part B of the assignment requires the students to successfully complete specific requirements for the web site. Partial credit is given for meeting the various requirements. One web page assignment concerns the individual student creating a personal teaching portfolio. The second web site assignment requires teams of students (2-6) to create a teaching resources site. Web sites are reviewed online and graded by the instructors. Team members receive a common grade for their collective work.

Tutorial assignments are online tutorials on various software
applications that students need to take and earn a passing grade of 70%. Once students reach the passing grade level they are given full credit for the assignment (a pass or fail grading system). The three tutorials are for computer operations, Dreamweaver training, and Excel training.

A Total Course Points variable is also included in this research. The instructors determine final grades using the total course points. The Total course points represents the sum of point values for each assignment as well as points for extra credit given to students for attendance at each lecture and laboratory and for completion of the pre-course Profiler and a post-course Profiler.

Due to various grading practices used in this course some of the assignments have a limited distribution of scores. Since some assignments were pass-fail and/or students were allowed to mediate their work, the scores in these assignments ended up with a small distribution of possible scores and in some case with a common score value.

Subjects

Participants in the study consist of students enrolled in two introductory technology courses in teacher preparation programs in the College of Education at WMU. These courses are EDT 347 – Technology for Elementary Education, and SPED 537 – Technology in Special Education. The participating sections of EDT 347 are from Fall semester 2001 (282 students), as well as from Winter (205 students) and Fall semesters 2002 (228 students). The participating sections of SPED 537 are from Fall semester of 2001 (55 students). Thus, the research population for this study includes students from all aforementioned sections for a total of 770 subjects.
At the beginning of each semester for Fall 2001 and Winter 2002, the researcher and Dr. Howard Poole presented the research study to students in both EDT 347 and SPED 537 courses. The presentation was conducted following a script (see Appendix C). Additionally, students were provided with a letter of consent (see Appendix B). All students in the introductory technology classes were asked to participate in the study, thus; students volunteering to participate will make up the research sample. Letters of consent were collected at the end of each one of the presentations of the study. Those students who did not agree to participate are not part of the research sample or included in the analysis of the data.

Selection Criteria

Selection criteria were applied to the research population. Students who met the following criteria were selected as participants of the study. Students needed to be enrolled in the EDT 347 course for the Fall semester of 2001, Winter or Fall semester of 2002. Students needed to be enrolled in the sections of the SPED 537 course in the Fall semester of 2001. Students who agree to participate in the study (Fall 2001, and Winter 2002), and who took the ETPS at the beginning and at the end of the semester while taking the course in the specific semesters already mentioned.

Variables

Variables are the characteristics or factors that the researcher manipulates, controls or observes (Best & Khan, 1998), can take different values or categories (Johnson & Christensen, 2000; Tuckman, 1999). Variables can be measured, sometimes called quantitative, or categorical, also known as
qualitative (Wallen & Fraenkel, 2001). The quantitative variable varies in degree or amount and usually involves numbers, while the qualitative varies in type or kind and usually involves different groups or categories (Johnson & Christensen, 2000). For the purpose of this study the researcher is considering measured as well as categorical variables. The following are the source of the variables included in the study: student’s academic performance, student’s technology skills, the student’s declared majors, and student’s gender.

Dependent Variable

The dependent variable is the academic performance, a continuous variable, measured through the scores assigned to assignments in the two introductory technology courses, EDT 347 and SPED 537. EDT 347 has 22 assignment scores, and SPED 537 has 14 assignment scores (see Tables 1 and 2).

Independent Variables

In this study the researcher identifies three independent variables. The first independent variable is technology skills, a continuous variable, represented through the scores in the ETPS survey. The original ETPS survey has a total of 48 items and the revised ETPS survey has a total of 40 items. Each item has a score value of 1 to 5. The instrument uses a Likert scale of five points, where 1 is strongly disagree, 2 disagree, 3 not sure, 4 agree, and 5 strongly agree. The second independent variable is the declared educational major, a nominal variable; in this case the majors are regular elementary education with the value 1, and special education with the value 0. The third independent variable is gender, a nominal variable, male, identified with the
value 1, and female, with the value 2.

Collection of Data

Data utilized in this research study were collected from different sources. One of the sources is the Profiler System, which houses the ETPS instrument. Profiler will provide scores representative of the technology skill level of students in the courses. Another source is the course management systems which house all grading records kept for the introductory technology courses EDT 347 and SPED - 537 involved in the study (see Appendix E). Data related to education major and gender is collected from the respective course class roster provided by the University.

The course management person of the PT³-CLT³ Grant is responsible for the organization and storage of the data. The course management person cleaned and coded the data, so that no identifiers were passed on to the researcher for the statistical analysis. However, the researcher controlled the process used to clean and code the data. At no time was the researcher in contact with the data before it was cleared of all identifiers.

Profiler System

The data utilized in this study were collected from the aforementioned introductory technology courses EDT 347 and SPED 537. Permission to collect this data was secured from the institutional officials responsible (see Appendix A). Following a brief presentation of the study (see Appendix C), a letter of consent (see Appendix B) was presented to all students in the courses involved in the study. Students responded to the letter by printing their name, giving their signature, and checking the space provided for either agreeing or not
agreeing to participate in the research study. The institutional board approved all forms used to present the study to the students. Data was secured from the Profiler system and held securely by the course management person until the course was over and grades released.

When the semesters were completed the Profiler Technical Support office was contacted and a request was made to transfer the ETPS survey scores to the researcher. When the data was received there were a total of 1,476 entries for the year of 2001, including Fall 2001. A second set of data, 523 entries was received for Winter 2002 and a third set of 194 entries for the Fall of 2002. A total of 2193 entries for all sections combined were obtained from the Profiler Technical Support office.

The year 2001 set of data was reduced to only students participating in the EDT 347 and SPED 537 courses in the Fall semester (a total of 852 entries). The next step was to divide the group into one of three categories: 1) those who consented, 2) those who did not consent, and 3) those who did not answer to the letter of consent. Group one was composed of those who agree to participate (525 entries). From the 525 entries multiple submissions were eliminated in order to obtain a final set that would reflect the pre and the post survey taken, for each student, during the Fall semester of 2001. In order to classify the data, a code was given to differentiate participants who agree to participate in the study from those who did not agree to participate and also from those who did not respond to the letter of consent. In this case, students who agreed to participate were given the code F011, which stands for Fall 2001 and 1 for yes. Students who did not agreed to participate were given the code F012, which stands for Fall 2001 and 2 for no. Finally, those students who did
not answer the letter of consent were left without any code. After all multiple submissions were eliminated, a total of 175 students from both courses, EDT 347 (140) and SPED 537 (35), remained for the research sample for the Fall semester of 2001.

The same procedure was followed to organize the data from the Winter semester of 2002. The subjects were coded as W021, which stands for Winter 2002 and 1 for yes. Students who did not agree to participate were given the code W022, which stands for Winter 2002 and 2 for no. From this coding process and the elimination of multiple submissions, a group of 108 students remained for the research sample. Students in this semester were in the general education program.

Data was stored in a spreadsheet format, using Microsoft Excel for Windows. A book with three separate spreadsheets was created, one for each group based on their given consent to participate in the study. Data was organized as follows, Sheet #1 contained participants who agreed to participate; Sheet #2 contained participants who did not agree to participate; and, Sheet #3 contained participants who did not answer the letter of consent.

In the process of recoding, the researcher was informed that many of the participants in the study had taken the ETPS survey more than two times in the semester. The researcher created a method of selection to choose the surveys that would be part of the study, in order to create a final set of data that would reflect a pre and post survey. From the classified data by consent, multiple submissions were eliminated using the following procedure. When multiple submissions were encountered, the day and the time when the survey was taken were considered. The earliest submission of the survey, at the
beginning and at the end of the semester, was selected as the one to be used in
the study and for subsequent correlation. Once all multiple submissions were
discarded, the data was recoded to eliminate all identifiers. A number was
assigned to each participant with care taken to maintain the same number for
data from both Profiler survey and the course management systems.

A slightly different procedure was followed for the Fall semester of
2002. In this case the data was already stored by the PT³-CLT³ Course
Management person. Permission to use this data was provided by the
institutional board based on a existing course records basis. Students enrolled
in the course were not presented with the study, nor were they asked to grant
consent to participate in it. The sample for this group was chosen following
the requirements previously described. A total of 192 students met all the
requirements and were considered as part of the research sample for this
study. This semester had students in the general education program (155) and
students in the special education program (37).

The research sample for this study includes students from all
aforementioned sections for a total of 475 subjects. This data was free of all
student identifiers, thus keeping all information confidential. The researcher
erminated the research sample data in the computer software SPSS 11.5.0, for
Windows to be statistically analyzed.

For the purpose of statistical analysis in this research study, the
researcher created several new variables in the computer software SPSS 11.5.
These variables are clusters scores that represent the ISTE Standards in the
ETPS survey. The clusters match the same distribution of ETPS Items as
described in Chapter II. The distribution of the 40 items by standard, for the
revised version of the Educational Technology Profiler Survey, is as follows: Standard I, Items 1-6; Standard II, Items 7-12; Standard III, Items 13-18; Standard IV, Items 19-24; Standard V, Items 25-30; Standard VI, Items 31-35; and, Cluster AT, Items 36-40. The value of these cluster variables is the sum of all the items that compose each one of the Standards. For example, ETPS Revised Standard One cluster value is the sum of ETPS Items 1 through 6.

Other clusters were also created, the Total Pre-Test cluster, Total Post-Test cluster, and Total Gain cluster. The Total Pre-Test is the sum of all the clusters in the pre-test, which is the sum of all the Pretest Item scores in the pre-test version taken of the survey. The Total Post-Test cluster follows the same format as the Pre-test but using the clusters in the Post-test. The Total Gain is the cluster that represents the gain obtained from subtracting the Total Post-Test minus the Total Pre-Test. These variables were created with the intent of better representing the ISTE standards used as part of in the study.

Blackboard and WebCT System

Blackboard and WebCT, as presented in chapter II, were the course management systems in place for all sections of the courses involved in the study. The systems held the grades and other records for all students in the courses (see Appendix E). Blackboard and WebCT provided a list of students in the class with their respective grades for each assignment in the respective course. Grades were collected from subjects who met all of the selection criteria for the study (see Selection Criteria, Chapter III). Data from the course management systems were recoded to eliminate all identifiers following the same procedure used with the data from the Profiler system. The data collected in terms of grades was then saved as a spreadsheet to be entered and
statistically analyzed in the computer software SPSS 11.5.0, for Windows. However, in the case of the Blackboard Management System, the researcher was unable to collect assignment scores for students enrolled in the Fall semester of 2001. The Blackboard Management System was in the process of reorganizing to start charging a course fee for their services. Data from courses using the Blackboard System was not archived and therefore was not available to the researcher.

Class Course Roster

Data related to the education major and gender were collected from the respective class course rosters provided to instructors of all courses at WMU. For the purposes of this study, class course rosters for the courses EDT 347 in the Fall 2001, Winter and Fall 2002, and SPED 537 were used. Data related to the education major were collected and coded. In terms of major, data was coded as 1 for regular elementary education, and 0 for special education. Data was clean of all identifiers following the same procedure used in Profiler. Data related to gender were collected and coded as 1 for male and 2 for female. Data was clean of all identifiers following the same procedure used in Profiler. This data was then entered and statistically analyzed in the computer software SPSS 11.5.0, for Windows.

Data Analysis

This research study involves the ETPS survey completed by students in two introductory technology classes in general education and special education teacher programs. The researcher intends to 1) demonstrate the level of interaction between variables, and 2) determine the reliability of the
Educational Technology Profiler Survey instrument used in the introductory technology courses in teacher preparation programs at Western Michigan University. The research questions seek to determine the relationship among the different variables in the study. As the research questions are answered, the researcher also intends to determine how reliable the Educational Technology Profiler Survey is for gathering information on the perceived technology skill level of students in introductory technology courses in teacher preparation programs at Western Michigan University. The scores obtained from the ETPS survey and Blackboard/WebCT will be used to discover those relationships between the variables.

The data in this research study is analyzed through the use of descriptive analysis, the Alpha (Cronbach) test, Pearson product-moment correlation, Two-Way ANOVA, and t-test for independent samples. These techniques are described below.

**Descriptive Analysis**

Descriptive data regarding participants in the study and the variables involved will be summarized in Chapter 4. This provides the reader with an overview of the distribution of participants throughout the sections and semesters of the courses in this research study.

**Alpha (Cronbach) Test**

This is a model of internal consistency, based on the average inter-item correlation. The researcher did a reliability analysis of the ETPS, using the Alpha Test, to find information about the relationships between individual items in the scale and to get an overall index of the repeatability or internal
consistency of the scale as a whole. This is performed separately for the Winter and Fall semesters of 2002.

Bivariate Analysis

It is of importance for the researcher to consider how the variables relate to each other. This was accomplished through the use of a bivariate correlation procedure to produce Pearson product-moment correlation coefficients to measure the linear association between the independent variables on a continuous or interval scale. The correlation coefficient provides not only a measure of relationship between variables but also an index of the proportion of individual differences or variance in a variable that can be associated with the individual differences or variance of another variable (Schloss & Smith, 1999; Hinkle, Wiersma, & Jurs, 1988). The values of the Pearson product-moment correlation coefficient range from -1 to +1. The sign of the coefficient indicates the direction of the relationship, and its absolute value indicates its strength (Sheskin, 1997). The closer the values to -1 or +1, the stronger the relationships between the variables and the more likely the relationship to be significant. A weak relationship is expressed with values close to zero, a mild relationship is located between .30 and .50 while another expressed with values in the mid-range, .50 to .70 is considered a moderate relationship, and one expressed in the upper range, .70 to .90 is one strong relationship. A perfect relationship is one with a value of 1 (Schloss & Smith, 1999; Sheskin, 1997; Hinkle, Wiersma, & Jurs, 1988).

Analysis of Variance (ANOVA)

Since the researcher has set one of the hypotheses to find an interaction
between two independent variables on a dependent one, a Two-Way ANOVA is the most appropriate statistical test for this data analysis. For this study, the researcher has used the fixed-effects model where the independent variables (education major and gender) have fixed levels. This allows the researcher to select these levels of both independent variables to be contrasted to the dependent variable. Generalizations from these analyses can only be made to these levels (Schloss & Smith, 1999; Sheskin, 1997; Hinkle, Wiersma, & Jurs, 1988).

Independent Samples t-Test

The independent samples t-test procedure compares the means of two groups of cases, in this case, divided by their education major and gender, respectively. When there were not significant interactions using the previous test, the researcher, alternatively, used t-test for independent samples to find differences between academic performance and educational majors and gender separately.

For the purpose of this research study, the researcher is using the .05 level of significance to test the hypotheses. Findings from this research study will be reported in Chapter 4, values reflecting levels of significance of < .001 and < .10 will also be reported. The coded data were entered into data sets and analyzed using the Statistical Package for Social Science (SPSS – 11.5.0, SPSS, 2002) on the researcher's personal computer.

Hypothesis 1

The researcher will use correlational methodology to establish the relationship between students' performance on required class assignments
with their responses to the ETPS in response to hypothesis 1. Pearson product-moment correlation was the tool used to test this hypothesis. There is a number of correlations expected with specific ETPS Clusters of standards and ETPS Items related to Assignments in the course. Report of these correlations will be presented in chapter 4 and will be grouped by type of assignment.

Conceptual Hypothesis

There is a relationship between the academic performance and the technology skills of students in introductory technology courses in teacher preparation programs at WMU.

Operational Hypothesis

There is a correlation coefficient (r) greater than zero between academic performance and technology skills in introductory technology courses in teacher preparation programs at Western Michigan University.

Null Hypothesis

There is a correlation coefficient (r) of zero between academic performance and technology skills in introductory technology courses in teacher preparation programs at Western Michigan University.

Hypothesis 2

The researcher will use t-test for independent samples to test this hypothesis. The use of t-test for independent samples will find differences, if any, between academic performance of students in EDT 347 in relation to their educational majors. Reports on these findings are being presented in Chapter
4.

**Conceptual Hypothesis**

There is a difference in the academic performance of students in regular education and of those in special education majors in introductory technology courses in teacher preparation programs at WMU.

**Operational Hypothesis**

The academic performance mean of students in introductory technology courses in special education is higher than the academic performance mean of students in introductory technology courses in general education teacher preparation programs at Western Michigan University.

**Null Hypothesis**

The academic performance mean of students in introductory technology courses in special education is equal to the academic performance mean of students in introductory technology courses in general education teacher preparation programs at Western Michigan University.

**Hypothesis 3**

The researcher will use t-test for independent samples to test this hypothesis. The use of t-test for independent samples will find differences, if any, between academic performance of students in EDT 347 in relation to their gender. Reports on these findings are being presented in Chapter 4.

**Conceptual Hypothesis**

There is a difference in the academic performance of male and female
students in introductory technology courses in teacher preparation programs at WMU.

**Operational Hypothesis**

The academic performance mean of male students is higher than the academic performance mean of female students in introductory technology courses at WMU.

**Null Hypothesis**

The academic performance mean of male and female students in introductory technology courses in the teacher preparation program at Western Michigan University are equal.

**Hypothesis 4**

Two-Way Analysis of Variance methodology will be used to test the hypothesis that relates to the interaction of education major and gender on student's academic performance. If further analysis is required because the Analysis of Variance shows a statistically significant interaction, a Schefee Post Hoc test will be administered in order to determine the statistical significant interaction between variables (Johnson & Christensen, 2000). Findings from this procedure will be presented in chapter 4.

**Conceptual Hypothesis**

There is an interaction between major and gender on academic performance of students in introductory technology courses in the teacher preparation program at WMU.
Operational Hypothesis

The difference between the academic performance mean score of male and female students who major in special education minus the difference between the academic performance mean score of male and female students majoring in regular education for students in introductory technology courses in teacher preparation programs at WMU is greater than zero.

Null Hypothesis

The difference between the academic performance mean score of male and female students who major in special education minus the difference between the academic performance mean score of male and female students majoring in regular education for students in introductory technology courses in teacher preparation programs at WMU is equal to zero.

Limitations to the Research Study

There were data collection limitations to this study. In the process of collecting the data, the researcher was to be given the records including attendance and grades for all assignments, quizzes and tests from all courses related to the study, EDT 347 and SPED 537 in the Fall semester of 2001. For the EDT 347 section, the files containing the students' grades were lost from the Blackboard management system since it was in the process of privatizing the provision of their services in the Web. The researcher tried to contact technical support from this system but was unsuccessful on doing so. Thus, there were no grades for assignments in the course to correlate with ETPS. The researcher was not able to perform any statistical analysis to respond the
research questions posted for this study. In the case of SPED 537, there were three sections to the course. The researcher was the instructor of one of those sections and another instructor was in charge of the other two sections. The researcher did not receive records from those two sections. In the researcher’s section a total of 18 students in the course from which 17 agreed to participate, 15 females and 2 males. One of the males did not meet all requirements posted to be included in the sample. The number of participants in the researcher’s section was too low to be representative of the special education teacher preparation program. This was not an acceptable sample of the population to perform the comparisons proposed in the study.

This situation created a major turn in the course of the study because comparisons proposed in the research questions between the regular education and special education teacher preparation programs could not be performed. The researcher made the decision of adding other semesters of EDT 347 that would include students of both programs of study in order to compare the aforementioned groups. The researcher had to wait for the Winter and Fall semesters of 2002 to be completed and grades turned in order to add them to the research population sample used in this research study.

Another major limitation to this research study is in relation to the grading system used in the EDT 347 course. As explained before in this chapter, the grading practices used in this course for some of the assignments created a particular distribution of scores. In some cases assignments were graded in a pass/fail manner. In other occasions, students were allowed to mediate their job working for its completion. The scores in these assignments ended up with a very limited distribution of possible scores and in some cases
with a common score value. Through the statistical analysis process, these variables behaved as a constant. In this case, the researcher run statistical tests looking for the relationships between academic performance and educational majors and gender independently.

Summary

This chapter on methodology has included a description of the institutional setting and the subjects involved in the study. It has provided a description of the variables and their characteristics, and defined the dependent and independent variables. It presented a description of the procedures followed in the collection of the data as well as their analysis including the statistical tests used in such analysis and the hypothesis to be tested derived from the research questions. Lastly, it discussed the limitations to the research study.

Chapter IV, findings, will present information related to the results gathered from the statistical analysis and how these relate to the research hypotheses.
CHAPTER IV

FINDINGS

Introduction

This chapter includes the research findings from the data collected during the study. The chapter also includes all statistical analysis completed with the data. The findings will be presented in relationship to the research questions posted in Chapter I, to the semester the data was collected (i.e. Fall 2001, Winter 2002, and Fall 2002), and to the academic performance measure (i.e. assignment, quiz, score, etc.) used in the academic courses. The chapter will include discussion of the findings and their impact on proving or rejecting the different hypotheses included in this study. Descriptive information regarding the research study participants, the ETPS Profiler Survey, and the academic performance measures used in the study are also included in this chapter of findings.

Description of Research Population and Sample

Participants in this research study come from the teacher preparation programs in the College of Education at Western Michigan University. In the teacher preparation programs most students are required to take an introductory technology course. In the Elementary Education program, students take EDT 347 - Technology for Elementary Education. In the Special Education program, students take SPED 537 - Technology in Special
Education. For the purpose of this study the researcher used participants in the aforementioned courses during the following semesters Fall 2001, Winter 2002, and Fall 2002. The total number of students enrolled in the courses during those semesters makes up the research population. Those students who agreed to participate in the research study and whom had a complete set of data were selected for the research sample. Tables 4 and 5 represent a breakdown by semester of the participants in the study, the number of valid cases for the research sample, and the breakdown of the research sample by gender and major.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Enrollment</th>
<th>Research Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2001</td>
<td>337</td>
<td>175</td>
</tr>
<tr>
<td>(EDT347/SPED537)</td>
<td>100%</td>
<td>(51.9%)</td>
</tr>
<tr>
<td>Winter 2002</td>
<td>205</td>
<td>108</td>
</tr>
<tr>
<td>(only EDT347)</td>
<td>100%</td>
<td>(52.7%)</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>228</td>
<td>192</td>
</tr>
<tr>
<td>(only EDT347)</td>
<td>100%</td>
<td>(84.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>770</td>
<td>475</td>
</tr>
<tr>
<td>(100%)</td>
<td>(100%)</td>
<td>(61.7%)</td>
</tr>
</tbody>
</table>

The total population of students considered for this study included 770 students from three semesters (Fall 2001, Winter 2002, and Fall 2002). The valid cases from each semester, a total of 475 students, make up the research sample and ranged from approximately 50% of the research population in
Fall 2001 and Winter 2002 to 80% of the research population in Fall 2002. The final research sample was considered to be representative of the larger research population (see Table 4).

The research sample includes male and female students as well as special education and elementary education majors. As can be seen in Table 5, there are 58 males (12.2%) and 417 females (87.8%) in the research sample.

Table 5. Distribution of Research Sample by Semester for Gender and Education Major.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Gender</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Fall 2001</td>
<td>15</td>
<td>160</td>
</tr>
<tr>
<td>(EDT347/SPED537)</td>
<td>(8.6%)</td>
<td>(91.4%)</td>
</tr>
<tr>
<td>Winter 2002</td>
<td>17</td>
<td>91</td>
</tr>
<tr>
<td>(only EDT347)</td>
<td>(15.7%)</td>
<td>(84.3%)</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>26</td>
<td>166</td>
</tr>
<tr>
<td>(only EDT347)</td>
<td>(13.5%)</td>
<td>(86.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>417</td>
</tr>
<tr>
<td></td>
<td>(12.2%)</td>
<td>(87.8%)</td>
</tr>
</tbody>
</table>

The distribution of percentages for males and females is considered normal for the special education and elementary education majors at Western Michigan University and was expected. There were 72 special education majors (15.1%) and 403 elementary education majors (84.9%). The distribution of percentages between special education majors (a controlled
enrollment program) and the open enrollment elementary education majors was expected and is considered to be representative of the population of education students at Western Michigan University who participated in this study (see Table 5).

Description of Significant Findings for Hypothesis 1

Hypothesis 1

For Hypothesis 1, if there is a relationship between the academic performance and the technology skills of students in introductory courses in teacher preparation programs at WMU. Pearson Product-Moment Correlations were performed comparing the academic assignments in the introductory technology course with various Cluster scores and individual Item scores on the ETPS survey.

Winter Semester of 2002

For the Winter semester of 2002, the tables 6 through 11 are organized around the various academic assignments. The tables include the ETPS cluster scores (i.e. I, II, III, IV, V, VI, and AT), the ETPS Total Post Test Score (a sum of all cluster scores), and the individual ETPS Item Scores (i.e. Items #1 through #40) found to be significantly correlated with the assignments. Also included in the Tables 6 through 11 are the ETPS cluster scores and individual ETPS Items that were pre-determined by the researcher to be related to the assignments (i.e. The pre-determined items are listed in the assignment column below the assignment title). Also included in Tables 6 through 11 are the p Values for significantly correlated ETPS Cluster Scores and Items.
Total Course Points

The Total Course Points represents the cumulative points for all academic assignments and for all attendance points in the course. Total Course Points represent a summative measure of academic performance for the course and was used by the course instructors to determine final grades for the course. Total Course Points was found to be significantly correlated with Cluster Score III (Teaching, Learning, and the Curriculum) and Cluster Score V (Productivity and Professional Practice) at the .05 level of significance. Total Course Points was also significantly correlated to Cluster Score II (Planning and Designing Learning Environments and Experiences) at the .10 level of significance. The nature of these correlations was considered to be "weak" and they ranged from p = .189 to .231 (see Table 6).


<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Significant Clusters</th>
<th>Significant Items</th>
<th>p Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Course Points</td>
<td>Cluster II</td>
<td></td>
<td>.189***</td>
<td></td>
</tr>
<tr>
<td>(No Cluster Scores or Items were predetermined by the researchers to be related to summative measure of academic performance.)</td>
<td>Cluster III</td>
<td></td>
<td>.206*</td>
<td>.296**</td>
</tr>
<tr>
<td></td>
<td>Cluster V</td>
<td></td>
<td>.231*</td>
<td>.263**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

Total Course Points were also correlated to ETPS Items 13 and 15 at the
.01 level and Items 16 and 17 at the .10 level. These four Items were included in ETPS Cluster III, which was also found to be weakly correlated with Total Course Points. Total Course points were also correlated to ETPS Item 22 at the .01 level and Item 20 at the .05 level of significance. These two Items were included in ETPS Cluster IV, which was not found to be correlated to Total Course Points. Item 9 in ETPS Cluster II was found to be correlated at .10 level of significance. All of these correlations were determined to be "weak" correlations and ranged from p = .174 to .296. Since no relationships were pre-determined by the researcher for the Total Course Points, no findings are reported (see Table 6).

**Microsoft Publisher (Newsletter) Assignment**

The Microsoft Publisher Assignment (creating a newsletter) was predetermined by the researcher to be related to ETPS Cluster V (Productivity and Professional Practice) and ETPS Item 29 (see Table 7). The Publisher Assignment was found to be significantly correlated with ETPS Cluster III (Teaching, Learning, and the Curriculum), ETPS Cluster V (Productivity and Professional Practice), ETPS Cluster VI (Social, Ethical, Legal, and Human Issues), and ETPS Total Post Test (sum of all Cluster Scores) all at the .05 level and with ETPS Cluster IV (Assessment and Evaluations) at the .10 level of significance. The nature of these correlations were determined to be "weak" and ranged from p = .181 to .249 (see Table 7). The Publisher Assignment was found to be correlated with a majority of the ETPS Cluster Scores (five out of seven). The Publisher Assignment is also researcher as being related (see Table 7).

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
<td>Cluster III</td>
<td>.199*</td>
<td>4</td>
<td>.279**</td>
</tr>
<tr>
<td>Assignment</td>
<td>Cluster IV</td>
<td>.181**</td>
<td>10</td>
<td>.185**</td>
</tr>
<tr>
<td>(Cluster V and Item 29)</td>
<td>Cluster V</td>
<td>.238*</td>
<td>11</td>
<td>.206*</td>
</tr>
<tr>
<td></td>
<td>Cluster VI</td>
<td>.249*</td>
<td>15</td>
<td>.222*</td>
</tr>
<tr>
<td>Total Post Test</td>
<td></td>
<td>.222*</td>
<td>16</td>
<td>.190**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>18</td>
<td>.233*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>.294**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>29</td>
<td>.410**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>.307**</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>34</td>
<td>.347**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>35</td>
<td>.277**</td>
</tr>
<tr>
<td>Digital Divide Paper</td>
<td>(No Significant</td>
<td></td>
<td>16</td>
<td>.225*</td>
</tr>
<tr>
<td>clusters found)</td>
<td></td>
<td></td>
<td>22</td>
<td>.214*</td>
</tr>
<tr>
<td>(Cluster VI and Items 31)</td>
<td></td>
<td></td>
<td>31</td>
<td>.333**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33</td>
<td>.280**</td>
</tr>
<tr>
<td>PowerPoint Assignment</td>
<td>(No Significant</td>
<td></td>
<td>23</td>
<td>-.161***</td>
</tr>
<tr>
<td>(St II, V, and Items 7 and 27)</td>
<td>clusters found)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Operations Assignment</td>
<td>(No Significant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(St I and Items 5 and 6)</td>
<td>clusters found)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(no Items found)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

correlated with the one ETPS Cluster Score (Cluster V) predetermined by the
There were significant correlations between 11 individual ETPS Items and the Publisher Assignment. ETPS Items 4, 23, 29, 30, 34 and 35 were significantly correlated at the .01 level, Items 11, 15 and 18 were significantly correlated at the .05 level and Items 10 and 16 were at the .10 level. The nature of most of the correlations were determined to be "weak" and ranged from $p = .185$ to .279. Three of the correlations were determined to be "mild" ranging from $p = .307$ to .410. The highest correlation ($p = .410$) for ETPS Item 29 was predetermined by the researcher to be related to the Publisher Assignment. There is at least one ETPS Item in each of the EPTS clusters significantly correlated with the Publisher Assignment (see Table 7).

**Digital Divide Paper Assignment**

The Digital Divide Assignment is a short essay on the topic. The assignment was predetermined to be related to ETPS Cluster VI (Social, Ethical, Legal, and Human Issues) and ETPS Item 31. There were no significant correlations found between the Digital Divide Assignment and the seven ETPS Cluster Scores. There were significant correlations with ETPS Items 31 and 33 at the .01 level of significance and ETPS Items 16 and 22 at the .05 level. All of the correlations were determined by the researcher to be "weak" and ranged from $p = .214$ to .333. The highest correlation ($p = .333$) was with ETPS Item 31 that was predetermined by the researcher to be related with the Digital Divide Assignment.

**Power Point Presentation Assignment**

The PowerPoint Assignment (i.e. creating a short PowerPoint presentation) was predetermined by the researcher to be related to ETPS
Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster V (Productivity and Professional Practice), and ETPS Items 7 and 27. There were no significant correlations found between the PowerPoint Assignment and the seven ETPS Cluster Scores. Only one significant correlation was found between the PowerPoint Assignment and an individual ETPS item. There was a negative correlation (p = -.161) with Item 23 at the .10 level of significance. The correlation was determined by the researcher to be "weak". None of the predetermined relationships were found to be significantly correlated with the Powerpoint Assignment.

**Computer Operations Assignment**

The Computer Operations Assignment had students exploring the hardware, software, and cable connections for computers in a lab setting. The researcher predetermined that ETPS Cluster I and ETPS Items 5 and 6 were related to the Computer Operations Assignment. No significant correlations were found for the Computer Operations Assignment.

**TaskStream Lesson Plan A Assignment**

Lesson Plan A Assignment (creating a lesson plan with TaskStream that integrates web sites into the lesson) was predetermined by the researcher to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching Learning and the Curriculum), ETPS Cluster IV (Assessment and Evaluation), and ETPS Cluster AT (Assistive Technology). Lesson Plan A Assignment was also predetermined to be related to ETPS Items 10, 11, 12, 15, 17, 18, 19, 20, and 37 (see Table 8). Lesson Plan A was found to be significantly correlated with

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Plan A Assignment</td>
<td>Cluster II</td>
<td>.232*</td>
<td>12</td>
<td>.197*</td>
</tr>
<tr>
<td>(Cluster II, III, IV, AT. Items 10, 11, 12, 15, 17, 18, 19, 20, 37)</td>
<td>Cluster III</td>
<td>.259**</td>
<td>13</td>
<td>.164***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td>.208*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>.166***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>39</td>
<td>-.171***</td>
</tr>
<tr>
<td>Web Site Evaluation</td>
<td>Cluster II</td>
<td>.199***</td>
<td>4</td>
<td>.231*</td>
</tr>
<tr>
<td>(St IV. Items 19)</td>
<td>Cluster III</td>
<td>.262*</td>
<td>8</td>
<td>.291**</td>
</tr>
<tr>
<td></td>
<td>Cluster VI</td>
<td>.174***</td>
<td>17</td>
<td>.237*</td>
</tr>
<tr>
<td></td>
<td>Total Post</td>
<td>.204***</td>
<td>18</td>
<td>.175***</td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

ETPS Cluster III at the .01 level and ETPS Cluster II at the .05 level of significance. The correlations were judged to be "weak" and ranged from \( p = .232 \) and \( .259 \) respectfully. Both of the correlations were predetermined by the researcher to be related to the Lesson Plan A Assignment (see Table 8).

Five individual ETPS Items were found to be correlated with the Lesson Plan A Assignment; Items 12 and 22 at the .05 level and Items 13, 25, and 39 at the .10 level of significance. All correlations were determined to be weak.
"weak" and ranged from $p = -.171$ to $.208$. ETPS Item 12 was the only item predetermined by the researcher to be related to the Lesson Plan A Assignment where a significant correlation was found.

**Web Site Evaluation Assignment**

The Web Site Evaluation (i.e. where students evaluated a web site they used in Lesson Plan A) was predetermined by the researcher to be related to ETPS Cluster IV (Assessment and Evaluation) and ETPS Item 19. The Web Site Evaluation Assignment was found to be significantly correlated to ETPS Cluster III (Teaching, Learning and the Curriculum) at the .05 level, and to ETPS Cluster II (Planning and Designing learning Environments and Experiences), ETPS Cluster VI (Social, Ethical, Legal, and Human Issues), and ETPS Total Post Test (sum of all cluster scores) at the .10 level of significance. All correlations were determined to be "weak" and ranged from $p = .174$ to $.262$. There was no significant correlation found between the Web Site Evaluation Assignment and ETPS Cluster IV as was predetermined by the researcher (see Table 8).

The Web Site Evaluation was found to be significantly correlated with eight ETPS Items. ETPS Item 8 was found to be significantly correlated with the assignment at the .01 level of significance. ETPS Items 4, 17, 22 and 35 were found to be significantly correlated at the .05 level, and Items 18, 25 and 37 at the .10 level. There was no significant correlation between the Web Site Evaluation and ETPS Item 19 that was predetermined by the researcher. The nature of the significant correlations were determined to be of a "weak" nature and ranged from $p = .175$ to $.291$ (see Table 8).
TaskStream Lesson Plan B Assignment

The Lesson Plan B Assignment (i.e. creating a lesson plan with TaskStream that integrates an Excel spreadsheet in the lesson) was predetermined to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and The Curriculum), and ETPS Cluster IV (Assessment and Evaluation). Lesson Plan B Assignment was also predetermined by the researcher to be related to ETPS Items 10, 12, 13, 15, 20, and 22. Lesson Plan B Assignment was found to be significantly correlated to ETPS Cluster III and ETPS Cluster V at the .05 level of significance. The ETPS Cluster III was pre-identified by the researcher as having a possible relationship with Lesson Plan B. The correlations were judged to be "weak" and ranged from \( p = .240 \) to \( .244 \) (see Table 9).

The Lesson Plan B was also found to be significantly correlated with 10 individual ETPS Items. ETPS Items 13, 15 and 22 were significantly correlated at the .01 level, ETPS Items 18, 26, 28, and 35 were significantly correlated at the .05 level, and ETPS Items 9, 17, and 25 were correlated at the .10 level of significance. The nature of all but two of the correlations was determined to be "weak", ranging from \( .176 \) to \( .255 \). The nature of two of the correlations, ETPS Items 22 (\( p = .399 \)) and 13 (\( p = .496 \)) were determined to be "mild" and "moderate", respectively. ETPS Items 13, 15, and 22 were pre-identified by the researcher as having a relationship with Lesson Plan B Assignment (see Table 9).

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Plan B Assignment</td>
<td>Cluster III</td>
<td>9</td>
<td>.182***</td>
</tr>
<tr>
<td>(St II, III, IV. Items 10, 12, 13, 15, 20, 22)</td>
<td>Cluster V</td>
<td>13</td>
<td>.496**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>.255**</td>
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<tr>
<td></td>
<td></td>
<td>17</td>
<td>.178**</td>
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<td></td>
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<td>28</td>
<td>.201*</td>
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<tr>
<td></td>
<td></td>
<td>35</td>
<td>.178*</td>
</tr>
<tr>
<td>Lesson Plan C Assignment</td>
<td>(No Significant clusters found)</td>
<td>10</td>
<td>.235*</td>
</tr>
<tr>
<td>(St II, III, IV, V. Items 10, 12, 15, 16, 17, 20, 26)</td>
<td></td>
<td>15</td>
<td>.190***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>.169***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>-.219*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27</td>
<td>-.202*</td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

**TaskStream Lesson Plan C Assignment**

Lesson Plan C Assignment (i.e. creating a lesson plan with TaskStream that integrates virtual field trips and distance learning in the lesson) was predetermined by the researcher to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III...
Lesson Plan C was predetermined by the researcher to be related to ETPS Items 10, 12, 15, 16, 17, 20 and 26. There were no significant correlations found between Lesson Plan C and the various ETPS Cluster Scores.

There were five significant correlations found with individual ETPS Items (see Table 9). Lesson Plan C was positively correlated with ETPS Item 10 at the .05 level, and ETPS Items 15 and 20 at the .10 level of significance. Lesson Plan C was also significantly negatively correlated with ETPS Items 24 and 27 at the .05 level. ETPS Items 10, 15, and 20 were pre-identified by the researcher as being related to Lesson Plan C. All of the significant correlations were determined to be "weak" and ranged from $p = -0.219$ to $0.235$ (see Table 9).

**Electronic Portfolio A Assignment**

Electronic Portfolio A (i.e. creating six draft interlinked web pages) was predetermined to be related to ETPS Clusters Score I (Technology Operations and Concepts), ETPS Cluster II (Planning and Designing Learning Environments and Experiences), and ETPS Cluster V (Productivity and Professional Practice). Electronic Portfolio A was also predetermined by the researcher to be related to ETPS Items 3, 9, 25, 27, and 28. There were no significant correlations found between the Electronic Portfolio A Assignment and the ETPS Cluster Scores. However, there were significantly correlations found between Portfolio A Assignment and five ETPS Items. ETPS Items 3, 24, 26, and 29 were found to be significant at the .05 level and ETPS Item 21 at the .10 level. The significant correlation between the Electronic Portfolio A

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Portfolio Part A</td>
<td>(No Significant clusters found)</td>
<td>3</td>
<td>.220*</td>
<td></td>
</tr>
<tr>
<td>(Cluster I, II, V. Items 3, 9, 25, 27, 28)</td>
<td></td>
<td>21</td>
<td>.187***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>.219*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>26</td>
<td>.193*</td>
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<td></td>
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<td>.223*</td>
<td></td>
</tr>
<tr>
<td>Electronic Portfolio Part B</td>
<td>II</td>
<td>.167***</td>
<td>9</td>
<td>.255**</td>
</tr>
<tr>
<td>(Cluster I, II, V. Items 3, 9, 25, 27, 28)</td>
<td></td>
<td>10</td>
<td>.172***</td>
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<tr>
<td></td>
<td>III</td>
<td>.235*</td>
<td>13</td>
<td>.285**</td>
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<tr>
<td></td>
<td>V</td>
<td>.187*</td>
<td>15</td>
<td>.239*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
<td>.200*</td>
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<td></td>
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<td></td>
<td></td>
<td>20</td>
<td>.183***</td>
<td></td>
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<td></td>
<td></td>
<td>22</td>
<td>.186***</td>
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</tbody>
</table>

* < .05, ** < .01, *** < .10

Assignment and ETPS Item 3 was pre-identified by the researcher. All correlations were considered to be of a "weak" nature and ranged from p = .187 to .223 (see Table 10).

**Electronic Portfolio B Assignment**

The Electronic Portfolio B Assignment (i.e. students fully completing the six page interlinked student portfolio) was predetermined by the
researcher to be related to ETPS Cluster Score I (Technology Operations and Concepts), ETPS Cluster II (Planning and Designing Learning Environments and Experiences), and ETPS Cluster V (Productivity and Professional Practice). Electronic Portfolio B was predetermined to be related to ETPS Items 3, 9, 25, 27, and 28. A significant correlation was found between the Portfolio B and the ETPS Cluster III and ETPS Cluster IV at the .05 level of significance and between ETPS Cluster II at the .10 level of significance. There was a pre-identified correlation between ETPS Clusters II and V and the Portfolio B Assignment. All of the significant correlations were judged to be "weak" ranging from \( p = .167 \) to \( .235 \) (see Table 10).

Eight significant correlations were found between the Electronic Portfolio B Assignment and ETPS Items. ETPS Items 9 and 13 were significantly correlated at the .01 level, ETPS Items 15, 17 and 18 were correlated at the .05 level and ETPS Items 10, 20 and 22 were at the at the .10 level. The correlation between the Electronic Portfolio B and ETPS Item 9 was pre-identified. The nature of all of the significant correlations were determined to be "weak" ranging from \( p = .172 \) to \( .255 \) (see Table 10).

**ThinkQuest Project A Assignment**

ThinkQuest Project A (i.e. students setting up a team, registering in ThinkQuest and developing a proposal for a web resource site using Inspiration) was predetermined to be related to EPTS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and the Curriculum), and ETPS Cluster V (Productivity and Professional Practice). ThinkQuest Assignment A was also predetermined to be related to ETPS Items 9, 11, 14, 17, and 26. No significant
correlations were found between the ThinkQuest Assignment A and any of the ETPS Cluster Scores or individual ETPS Items. None of the pre-identified relationships were found to be significant (see Table 11). Analysis of the distribution of scores on the ThinkQuest Assignment discovered that instructors graded all students with a score of 50. These scores behaved like a constant and did not allow for statistical analysis.

**ThinkQuest Project B Assignment**

The ThinkQuest Project B Assignment (i.e. a team presentation of the final resource web site) was predetermined to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and the Curriculum), and ETPS Cluster V (Productivity and Professional Practice). ThinkQuest Project B was also predetermined to be related to ETPS Items 9, 11, 14, 17 and 26 (see Table 11). The ThinkQuest Project B was found to be significantly correlated to ETPS Cluster Score V at the .01 level of significance, the ETPS Cluster VI at the .05 level, and the ETPS Cluster III at the .10 level of significance. Significant correlations between the ThinkQuest Project B Assignment and the ETPS Clusters III and V were pre-identified. The nature of significant correlations between the ThinkQuest Project B Assignment and the ETPS Clusters were considered to be "weak" and ranged from p = .171 to .291 (see Table 11).

The Assignment ThinkQuest Project B was also found to be significantly correlated with 16 individual ETPS Items. ETPS Items 13, 15, 19, 30 and 34 were significantly correlated at the .01 level of significance,

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
<th>p Value</th>
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<tr>
<td>ThinkQuest Project Part B</td>
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<td></td>
<td>.180***</td>
<td>.162***</td>
</tr>
<tr>
<td>(St II, III, V. Items 9, 11, 14, 17, 26,)</td>
<td>V</td>
<td></td>
<td>.291**</td>
<td>.253**</td>
</tr>
<tr>
<td></td>
<td>VI</td>
<td></td>
<td>.222*</td>
<td>.240*</td>
</tr>
<tr>
<td></td>
<td>Total Post</td>
<td></td>
<td>.171***</td>
<td>.270**</td>
</tr>
</tbody>
</table>

ETPS Items 14, 16, 20, 26, 29, 31, 36 and 37 were significantly correlated at the .05 level. ETPS Items 11, 27 and 38 were significantly correlated at the .10 level.

* < .05, ** < .01, *** < .10

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level. Only ETPS Items 11, 14 and 26 were pre-identified to have a significant relationship with ThinkQuest Project B (see Table 11). The nature of all of significant correlations between the ThinkQuest Project B Assignment and the various individual ETPS Items was determined to be "weak" and ranged from p = .162 to .301.

**Computer Operations and Concepts Quiz**

The Computer Operations and Concepts Quiz (a multiple-choice quiz on the topic) was predetermined by the researcher to be related to ETPS Cluster I (Technology Operations and Concepts), Cluster IV (Assessment and Evaluation), Cluster VI (Social, Legal, Ethical and Legal Issues) and Cluster AT (Assistive Technology), and Items 1, 2, 3, 4, 5, 6, 21, 33, 34, 36, 38, 39 and 40. This Quiz was found to be significantly correlated with Cluster Score I and VI at the .05 level of significance, both of these correlations were predicted (see Table 12). The correlations were considered to be of a "weak" nature ranging from .212 to .227.

The Computer Operations and Concepts Quiz was found to be correlated to nine ETPS Items. Items 3, 6, 16, 34 and 39 correlated at the .05 level of significance. Items 1, 2, 5 and 33 showed significant correlations at the .10 level. Eight out of the nine correlations were expected (see Table 12). All correlations were considered to be of a "weak" nature ranging from .165 to .248 (see Table 12).

**Assistive Technology Quiz**

The Assistive Technology Quiz (a multiple quiz on the subject) was predetermined to be related to ETPS Clusters VI (Social, Ethical, Legal and
Human Issues) and AT (Assistive Technology), and Items 33, 36, 37, 38, 39

Table 12. Pearson Product Correlation between Individual ETPS Cluster

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>p Value</th>
<th>ETPS Item</th>
<th>p Value</th>
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<tr>
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<td>I</td>
<td>.227*</td>
<td>1</td>
<td>.165***</td>
</tr>
<tr>
<td>(St I, IV, VI, AT. Items 1, 2, 3, 4, 5, 6, 21, 33, 34, 36, 38, 39, 40)</td>
<td>VI</td>
<td>.212*</td>
<td>2</td>
<td>.165***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>.206*</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>.190***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>.243*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>.246*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33</td>
<td>.190***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34</td>
<td>.248*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>39</td>
<td>.240*</td>
</tr>
<tr>
<td>Assistive Technology Quiz</td>
<td>V</td>
<td>.167***</td>
<td>3</td>
<td>.328**</td>
</tr>
<tr>
<td>(St. VI, AT. Items 33, 36, 37, 38, 39, 40)</td>
<td></td>
<td></td>
<td>9</td>
<td>.267**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13</td>
<td>.329**</td>
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<td></td>
<td></td>
<td></td>
<td>14</td>
<td>.190***</td>
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<td>22</td>
<td>.213*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>26</td>
<td>.165***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>29</td>
<td>.177***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>36</td>
<td>.171***</td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

and 40. The Assistive Technology Quiz was found to be significantly
correlated to Cluster V at the .10 level of significance. This correlation was
considered to be of a "weak" nature with a value of .167. No correlations between this Quiz and predicted Clusters were found. The AT Quiz was correlated with nine ETPS Items. Items 3, 9 and 13 at the .01 level of significance, ETPS Items 19 and 22 at the .05 level, and ETPS Items 14, 26, 29 and 36 at the .10 level of significance. Only one expected correlation was found with ETPS Item 39. All correlations were considered to be "weak" in nature and were ranging from .171 to .329 (see Table 12).

Summary of Significant Findings for the Winter Semester of 2002

Although there are a number of significant correlations (over a 100) found between the Assignments in EDT 347 in the Winter semester of 2002 and the ETPS Clusters scores and Items at different levels of significance, all the positive correlations are of a "weak" to "moderate" nature, ranging from \( p = .162 \) to .496 (see Table 13). Twelve out of fourteen assignments were found to have significant correlations. Eleven out of the fourteen had correlations that matched with the predetermined relationships established

Table 13. Summary of Winter 2002 Correlations by Assignment.

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Sig. p</th>
<th># of Sig. p</th>
<th>Nature of correlation</th>
<th>Significant predetermined correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Course Points</td>
<td>Yes</td>
<td>10</td>
<td>Weak</td>
<td>-</td>
</tr>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
<td>Yes</td>
<td>16</td>
<td>Weak to Mild</td>
<td>2/2</td>
</tr>
<tr>
<td>Digital Divide Paper</td>
<td>Yes</td>
<td>4</td>
<td>Weak</td>
<td>1/2</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>Yes</td>
<td>1</td>
<td>Weak</td>
<td>0/4</td>
</tr>
<tr>
<td>Assignments (continue)</td>
<td>Sig. p</td>
<td># of Sig. p</td>
<td>Nature of correlation</td>
<td>Significant predetermined correlations</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>-------------</td>
<td>-----------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Computer Operations and Concepts Assignment</td>
<td>No</td>
<td>0</td>
<td>-</td>
<td>0/3</td>
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<tr>
<td>Lesson Plan A</td>
<td>Yes</td>
<td>7</td>
<td>Weak</td>
<td>3/13</td>
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<tr>
<td>Web Site Evaluation</td>
<td>Yes</td>
<td>12</td>
<td>Weak</td>
<td>0/2</td>
</tr>
<tr>
<td>Lesson plan B</td>
<td>Yes</td>
<td>12</td>
<td>Weak to Moderate</td>
<td>4/9</td>
</tr>
<tr>
<td>Lesson Plan C</td>
<td>Yes</td>
<td>5</td>
<td>Weak</td>
<td>3/11</td>
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<td>Electronic portfolio A</td>
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<td>5</td>
<td>Weak</td>
<td>1/8</td>
</tr>
<tr>
<td>Electronic portfolio B</td>
<td>Yes</td>
<td>11</td>
<td>Weak</td>
<td>3/8</td>
</tr>
<tr>
<td>ThinkQuest B</td>
<td>Yes</td>
<td>20</td>
<td>Weak to Mild</td>
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<td>ThinkQuest A</td>
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<td>0</td>
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<td>Weak</td>
<td>10/17</td>
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<tr>
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<td>Weak to Mild</td>
<td>1/8</td>
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<tr>
<td>Summary</td>
<td>12/14</td>
<td>124</td>
<td>Weak to Moderate</td>
<td>33/105</td>
</tr>
</tbody>
</table>

by the researcher. However, only 33 of the 105 predetermined relationships were found to be significant (see Table 13).

**Fall Semester of 2002**

Hypothesis I for this study, as presented at the beginning of this section, explores the correlational relationships between the academic
performance of participants and their self-reported technology skills on the ETPS Profiler Survey. Pearson Product Correlations were performed between the academic assignments in the introductory technology courses and the various Cluster Scores and individual item scores on the ETPS survey. For the Fall semester of 2002, Tables 14 through 21 are organized around the various academic assignments for the EDT 347 course. The tables include the ETPS Cluster Scores (i.e. I, II, III, IV, V, VI, and AT), and the individual ETPS Item Scores (i.e. Items #1 through #40) found to be significantly correlated with the assignments. Also included in the Tables 14 through 21 are the ETPS Cluster scores and individual ETPS Items that were predetermined by the researcher to be related to the assignments (i.e. The predetermined items are listed in the assignment column below the assignment title). Also included in Tables 14 through 21 are the p Values for the Pearson coefficients found to be significantly correlated with each ETPS Cluster Scores and/or ETPS Items.

**Total Course Points**

The assignment Total Course Points represents the scores for all assignments and for all attendance points in the course. The Total Course Points represent the summative measure of academic performance for the course and was used by the instructors to determine the final grades for the course. Total Course Points was not found to be significantly correlated with any of the ETPS Clusters. However, it was found to be significantly correlated with ETPS Items 22 and 27 at the .05 level of significance. The nature of the correlations was considered to be "weak" ranging from .155 to .177. Since no relationships were predetermined by the researcher for the Total Course
Points Assignment, no findings are reported (see Table 14).


<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Course Points</td>
<td>(No Significant clusters found)</td>
<td>22</td>
<td>.155*</td>
<td></td>
</tr>
<tr>
<td>(No Cluster Scores or Items were predetermined by the researchers to be related to summative measure of academic performance.)</td>
<td></td>
<td>27</td>
<td>.177*</td>
<td></td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

PowerPoint Presentation Assignment

The Assignment PowerPoint (creating a short PowerPoint presentation) was predetermined by the researcher to be related to Cluster II (Planning and Designing Learning Environments and Experiences), Cluster V (Productivity and Professional Practice), and ETPS Items 7, and 27. There were no significant correlations found between the PowerPoint assignment and any of the seven ETPS Clusters Scores. The PowerPoint Assignment was found to be significantly correlated with ETPS Item 25 at the .01 level of significance, and negatively correlate (p = -.136) with ETPS Item 31 at the .10 level. The correlations were considered to be of a "weak" nature ranging from -.136 to .199. None of the predetermined relations were found to be significantly correlated with this Assignment (see Table 15).

Microsoft Publisher (Newsletter) Assignment

The Newsletter Assignment (a two to four page classroom newsletter) was predetermined by the researcher to be related to the ETPS Cluster V

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
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<tbody>
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<td>p Value</td>
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<tr>
<td>PowerPoint</td>
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<tr>
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<td></td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
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<td></td>
</tr>
<tr>
<td>(Clusters V, VI and Items 26, 29, 31, 32, 34, 35)</td>
<td>Clusters found)</td>
<td>(No</td>
</tr>
<tr>
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<td></td>
<td>Items</td>
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<tr>
<td></td>
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<td>4</td>
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<tr>
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</tr>
<tr>
<td>(Clusters I, IV, VI, AT and Items 1, 2, 3, 4, 5, 6, 21, 33, 34, 36, 38, 39, 40)</td>
<td>Clusters found)</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

(Productivity and Professional Practice) and VI (Social, Legal, Ethical and Human Issues), and ETPS Items 26, 29, 31, 32, 34, and 35. No significant correlations were found for the Newsletter Assignment, thus no findings are reported (see Table 15).

Computer Operations Assignment

The Computer Operations Assignment (a tutorial on computer parts, operations and functions) was predetermined by the researcher to be related to Clusters I (Technology Operations and Concepts), Cluster IV (Assessment and Evaluation), Cluster VI (Social, Legal, Ethical and Human Issues), Cluster AT (Assistive Technology), and Items 1, 2, 3, 4, 5, 6, 21, 33, 34, 36, 38, 39, and 40. There was no significant correlation found with any of the seven ETPS Clusters. The Computer Operations Assignment was found to be negatively
correlated with three ETPS Items. ETPS Item 16 was significant at the .05 level, and ETPS Items 4 and 24 at the .10 level of significance. Only one of the predetermined relationships, ETPS Item 4, was found to be significantly correlated. The correlations were considered to be of a "weak" nature ranging from -.132 to -.165 (see Table 15).

**TaskStream Lesson Plan A Assignment**

Assignment Lesson Plan A (creating a lesson plan with TaskStream integrating web sites in lesson) was predetermined by the researcher to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), Cluster III (Teaching, Learning and the Curriculum), Cluster IV (Assessment and Evaluation), Cluster AT (Assistive Technology), and ETPS Items 10, 11, 12, 15, 17, 18, 19, 20, and 37 (see table 16). There was no significant correlation found with any of the seven ETPS Clusters. The Assignment Lesson Plan A was found to be significantly negatively correlated with three ETPS Items. Correlations with ETPS Items 8, 26 and 39 were found to be significant at the .10 level. The nature of the correlations was considered to be "weak" ranging from -.136 to -.141. None of the predetermined relationships were found to be significantly correlated with Assignment Lesson Plan A (see Table 16).

**Excel Training Assignment**

The Excel Training Assignment (an online training program produced by SmartForce) was predetermined by the researcher to be related to ETPS Cluster IV (Assessment and Evaluation) and ETPS Items 21 and 22. There were no correlations found to be significant with any ETPS Cluster score or
ETPS Item, thus no findings are reported (see Table 16).


<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
</tr>
</thead>
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<td></td>
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<td>p Value</td>
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<tr>
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<td>Clusters found)</td>
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<td>(Clusters II, III, IV, AT and Items 10, 11, 12, 15, 17, 18, 19, 20, 37)</td>
<td>26</td>
<td>-.141***</td>
</tr>
<tr>
<td>Excel Training</td>
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<td>39</td>
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</tr>
<tr>
<td>(Cluster IV and Items 21, 22)</td>
<td>(No Items found)</td>
<td></td>
</tr>
<tr>
<td>Lesson Plan B</td>
<td>(No Significant</td>
<td>12</td>
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<tr>
<td></td>
<td>Clusters found)</td>
<td></td>
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<tr>
<td>(Clusters II, III, IV and Items 10, 12, 13, 15, 20, 22)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* < .05,  ** < .01,  *** < .10

TaskStream Lesson Plan B Assignment

The Lesson Plan B Assignment (creating a lesson plan with TaskStream that integrates an Excel spreadsheet in lesson) was predetermined by the researcher to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), Cluster III (Teaching, Learning and The Curriculum), Cluster IV (Assessment and Evaluation), and ETPS Items 10, 12, 13, 15, 20, and 22. There were no significant correlations found with any of the seven ETPS Cluster scores. The Lesson Plan B was found to be significantly correlated with one ETPS Item. ETPS Item 12 was significant at the .10 level. Item 12 was pre-identified as related to this Assignment.
correlation was judged to be “weak” and had a p value of -.140 (see Table 16).

**Dreamweaver Training Assignment**

The Dreamweaver Training Assignment (an online tutorial system for learning to use the Dreamweaver software) was predetermined to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and The Curriculum), and ETPS Items 9 and 14. The Dreamweaver Training Assignment was not found to be significantly correlated with any of the seven ETPS Clusters or Items. No predetermined relationships were found and no findings can be reported (see Table 17).

**Electronic Portfolio A Assignment**

Electronic Portfolio A (i.e. creating six draft interlinked web pages) was predetermined to be related to ETPS Clusters Score I (Technology Operations and Concepts), ETPS Cluster II (Planning and Designing Learning Environments and Experiences), and ETPS Cluster V (Productivity and Professional Practice). Electronic Portfolio A was also predetermined by the researcher to be related to ETPS Items 3, 9, 25, 27, and 28. The Electronic Portfolio A was found to be significantly negatively correlated with four ETPS Clusters; Clusters I, II, VI and AT. The Clusters were all found to be significantly correlated at the .10 level. The correlations were considered to be “weak” and ranging from -.134 to -.136. The correlations found between ETPS Clusters I and II and the Electronic Portfolio A were pre identified (see Table 17).

Six other significant negative correlations were found between
Electronic Portfolio A and ETPS Items. ETPS Items 4, 6 and 38 at the .05 level, and ETPS Items 7, 12 and 33 at the .10 level. None of the predetermined relationships were found to be significantly correlated with the Assignment. The nature of the correlations was considered to be "weak" ranging from \( p = -0.129\) to \(-0.158\) (see Table 17).

**Electronic Portfolio B Assignment**

The assignment Electronic Portfolio B (i.e. students fully completing the six page interlinked student portfolio) was predetermined by the
researcher to be related to ETPS Cluster I (Technology Operations and Concepts), ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster V (Productivity and Professional Practice), and ETPS Items 3, 9, 25, 27, and 28. The Electronic Portfolio B was found not to be significantly correlated to any of the seven ETPS Clusters. Electronic Portfolio B was found to be significantly correlated with three ETPS Items. Items 1, 27, and 38 were found to be statistically significant at the .05 level. The significant correlation between the Electronic Portfolio B and the ETPS Item 27 was pre identified by the researcher. All correlations were considered to be of a "weak" nature and ranged from .158 to .185 (see Table 17).

Midterm Test

The Midterm Test (i.e. demonstration of the use of Dreamweaver to create and upload two web pages to a server) was predetermined by the researcher to be related to Clusters II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and the Curriculum), and ETPS Items 9, 11, 14, and 17. There was a significant correlation found with ETPS Cluster I and II. ETPS Cluster II was significant at the .05 level, and Cluster I at the .10 level of significance. The correlation of Cluster II with this assignment was predetermined by the researcher. The nature of these correlations was considered to be "weak".

The Midterm Test was also found to be correlated with 16 ETPS Items. It was found to significantly correlate with ETPS Items 9, 10, and 30 at the .01 level. It also correlated with ETPS Items 7, 8, 11, 14, 15, 20, 21, 22, 29, and 32 at the .05 level of significance, and with ETPS Items 27, 28, and 36 at the .10 level.

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
<th>p Value</th>
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<tbody>
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<td>Midterm Test</td>
<td>Cluster I</td>
<td>7</td>
<td>.142***</td>
<td>.147*</td>
</tr>
<tr>
<td>(Clusters II, III and Items 9, 11, 14, 17)</td>
<td>Cluster II</td>
<td>8</td>
<td>.159*</td>
<td>.166*</td>
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<td>.231**</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
<td>.181*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
<td>.162*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>.169*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>.157*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21</td>
<td>.147*</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>22</td>
<td>.177*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>27</td>
<td>.132***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>28</td>
<td>.136***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>29</td>
<td>.155*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>.192**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32</td>
<td>.150*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>36</td>
<td>.137***</td>
<td></td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

level. The correlations of ETPS Items 9, 11 and 14 were predetermined by the researcher. The nature of the correlations was considered to be "weak" and range from p = .132 to .231 (see Table 18).
ThinkQuest Project A Assignment

ThinkQuest Project A (i.e. students setting up a team, registering in ThinkQuest and developing a proposal for a web resource site using Inspiration) was predetermined to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and the Curriculum), and ETPS Cluster V (Productivity and Professional Practice). ThinkQuest Assignment A was also predetermined to be related to ETPS Items 9, 11, 14, 17, and 26. No significant correlations were found between the ThinkQuest Assignment A and any of the ETPS Cluster Scores or individual ETPS Items. None of the pre-identified relationships were found to be significant (see Table 19). Analysis of the distribution of scores on the ThinkQuest Assignment discovered that instructors graded all students with a score of 100. These scores behaved like a constant and did not allow for statistical analysis.

ThinkQuest Project B Assignment

The ThinkQuest Project B Assignment (i.e. a team presentation of the final resource web site) was predetermined by the researcher to be related to ETPS Cluster II (Planning and Designing Learning Environments and Experiences), ETPS Cluster III (Teaching, Learning and the Curriculum), and ETPS Cluster V (Productivity and Professional Practice). ThinkQuest Project B was also predetermined to be related to ETPS Items 9, 11, 14, 17 and 26 (see Table 19). The ThinkQuest Project B was found to be significantly correlated to ETPS Cluster Score II at the .05 level of significance. Significant correlations between the ThinkQuest Project B Assignment and the ETPS Clusters II was pre identified. The nature of this correlation was considered to be "weak"
with a value of $p = .169$.

The assignment ThinkQuest Project B was significantly correlated with five ETPS Items. Item 31 was found to be significant at the .05 level, and ETPS Items 9, 10, 15, and 24 at the .10 level of significance. The correlation of ETPS Item 9 was predetermined by the researcher. The correlations were considered to be of a "weak" nature ranging from $p = .137$ to .150 (see Table 19).


<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p Value</td>
</tr>
<tr>
<td>ThinkQuest Project A</td>
<td>(No Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clusters found)</td>
<td></td>
</tr>
<tr>
<td>ThinkQuest Project B</td>
<td>Cluster II</td>
<td>.169*</td>
</tr>
<tr>
<td>(Clusters II, III, V and Items 9, 11, 14, 17, 26)</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>.137***</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>-.140***</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>.150*</td>
</tr>
</tbody>
</table>

* $< .05$, ** $< .01$, *** $< .10$

**Library/Media Center Quiz**

The Library/Media Center Quiz (i.e. a multiple choice quiz on the topic) was predetermined by the researcher to be related to ETPS Cluster III (Teaching, Learning and the Curriculum) and ETPS Item 18. No significant correlation was found between any of the seven ETPS Clusters. The
Library/Media Quiz was found to be significantly correlated with four ETPS Items. ETPS Items 7, 24, and 37 were found to have negative correlations at the .05 level of significance and a positive correlation to ETPS Item 10 at the .10 level. None of the predetermined ETPS Items correlated with this Assignment. The nature of the correlations was considered "weak" and ranged from $p = -.199$ to .139 (see Table 20).

**Assistive Technology Quiz**

The Assistive Technology Quiz (a multiple choice quiz on the subject) was predetermined to be related to ETPS Clusters VI (Social, Ethical, Legal and Human Issues) and AT (Assistive Technology), and Items 33, 36, 37, 38, 39 and 40. The Assistive Technology Quiz was not found to be significantly correlated to any of the seven ETPS Clusters.

The AT Quiz was correlated with two ETPS Items. Items 4 and 35 were found to be significantly correlated at the .01 level of significance. No expected correlation was found with predicted ETPS Clusters scores or ETPS Items. All correlations were considered to be "weak" in nature and were ranging from -.136 to .144 (see Table 20).

**Computer Labs Quiz**

The assignment Computer Labs Quiz (a multiple choice quiz on the subject) was predetermined by the researcher to be related to Cluster IV (Assessment and Evaluation) and Item 21. The Computer Lab Quiz was found to be significantly negatively correlated to ETPS Cluster III, not the

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p Value</td>
</tr>
<tr>
<td>Library/Media Center Quiz</td>
<td>(No Significant</td>
<td>7</td>
</tr>
<tr>
<td>(Cluster III and Item 18)</td>
<td>Clusters found)</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Assistive Technology Quiz</td>
<td>(No Significant</td>
<td>4</td>
</tr>
<tr>
<td>(Clusters VI, AT and Items 33, 36,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37, 38, 39, 40)</td>
<td>Clusters found)</td>
<td>35</td>
</tr>
<tr>
<td>Computer Labs Quiz</td>
<td>Cluster III</td>
<td>8</td>
</tr>
<tr>
<td>(Clusters IV. Item 21)</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18</td>
</tr>
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<td></td>
<td></td>
<td>23</td>
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<td></td>
<td></td>
<td>28</td>
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<tr>
<td></td>
<td></td>
<td>29</td>
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<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37</td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10

predicted Cluster. This correlation was significant at the .10 level, its nature was "weak" and had a value of p = -.139 (see Table 20). This Quiz was also found to be significantly correlated to ten ETPS Items. It was positively
correlated to Item 9 at the .10 level of significance. It was also found to be negatively correlated to ETPS Items 30 and 33 at the .01 level of significance; to ETPS Items 8,18,28,29, and 37 at the .05 level; and, to ETPS Items 9,16, and 23 at the .10 level of significance. No predetermined correlations were found with this Assignment. The nature of the correlations is "weak" and range from p = -.262 to .138 (see Table 20).

Field Trips-Distance Learning Quiz

The assignment Field Trips-Distance Learning Quiz (a multiple choice quiz on the subject) related to ETPS Cluster III (Teaching, Learning and the Curriculum), ETPS Cluster IV (Assessment and Evaluation), ETPS Cluster V (Productivity and Professional Practice), and Items 17,21, and 26. Field Trips-Distance Learning Quiz was not found to be significantly correlated to any of the seven ETPS Clusters.

Field Trips-Distance Learning Quiz was found to be significantly correlated to 11 ETPS Items. ETPS Items 11,18,27,31,32, and 36 were found to be significant at the .05 level of significance. ETPS Items 10,15,19,24, and 38 showed significant positive correlation at the .10 level. No predetermined ETPS Items were found to correlate with this assignment. The nature of the correlations was found to be of a "weak" nature and ranged from p = .131 to .191 (see Table 21).

Hand Held Devices Quiz

The Hand Held Devices Quiz (a multiple choice quiz on the subject) was predetermined to be related to ETPS Clusters I (Technology Operations and Concepts), ETPS Clusters IV (Assessment and Evaluation), and ETPS

<table>
<thead>
<tr>
<th>Academic Performance Assignments</th>
<th>Clusters and Totals</th>
<th>ETPS Item</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p Value</td>
<td>p Value</td>
</tr>
<tr>
<td>Field Trips-Distance Learning Quiz (Clusters III, IV, V. Items 17, 21, 26)</td>
<td>10 .143***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 .152*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 .137***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18 .169*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19 .133***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 .143***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>27 .191*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31 .171*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>32 .172*</td>
<td></td>
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<td></td>
<td>36 .162*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>38 .131***</td>
<td></td>
</tr>
<tr>
<td>Hand Held Devices Quiz (Clusters I, IV. Items 6, 21)</td>
<td>1 .146***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 .151*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 .153*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 -.170*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26 .179*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>27 .138***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31 .126***</td>
<td></td>
</tr>
</tbody>
</table>

* < .05, ** < .01, *** < .10
Items 6 and 21. The Hand Held Devices Quiz was not found to be significantly correlated to any of the seven ETPS Clusters.

The Hand Held Devices Quiz was found to be significantly correlated to seven of the ETPS Items. It was found to be significantly correlated with ETPS Items 2, 11, and 26, and negatively correlated with item 24 all at the .05 level of significance. ETPS Items 1, 27, and 31 showed a significant correlation at the .10 level. No predetermined ETPS Items were found to correlate with this Quiz. The nature of the correlations was found to be of a "weak" nature and ranged from $p = -0.170$ to 0.179 (see Table 21).

Summary of Significant Findings for the Fall Semester of 2002

Although there are a number of significant correlations (84) found between the Assignments in EDT 347 in the Winter semester of 2002 and the ETPS Clusters scores and Items at different levels of significance, all the correlations are of a "weak" nature, ranging from $p = -0.262$ to 0.231 (see Table 22). Fifteen out of eighteen assignments were found to have significant correlations. Only six out of the eighteen had significant correlations matching the predetermined relationships established by the researcher. However, only 11 of the 122 predetermined relationships were found to be significant (see Table 22).

The findings for Hypothesis 1 do not support that there is a correlation between Students' technology skills, as measured through their completion of the academic assignments in the course and their responses to the ETPS survey. For some individual assignments "weak" correlations were found and this will be discussed in the next chapter.
Table 22. Summary of Fall 2002 Correlations by Assignment.

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Sig. p</th>
<th># of Sig.</th>
<th>Nature of correlation</th>
<th>Significant predetermined correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total course points</td>
<td>Yes</td>
<td>2</td>
<td>Weak</td>
<td>-</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>Yes</td>
<td>2</td>
<td>Weak</td>
<td>0/4</td>
</tr>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
<td>No</td>
<td>0</td>
<td>-</td>
<td>0/8</td>
</tr>
<tr>
<td>Computer Operations</td>
<td>Yes</td>
<td>3</td>
<td>Weak</td>
<td>1/17</td>
</tr>
<tr>
<td>Lesson Plan A</td>
<td>Yes</td>
<td>3</td>
<td>Weak</td>
<td>0/13</td>
</tr>
<tr>
<td>Excel Training</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>0/3</td>
</tr>
<tr>
<td>Lesson Plan B</td>
<td>Yes</td>
<td>1</td>
<td>Weak</td>
<td>0/13</td>
</tr>
<tr>
<td>Dreamweaver Training</td>
<td>Yes</td>
<td>1</td>
<td>Weak</td>
<td>0/4</td>
</tr>
<tr>
<td>Electronic Portfolio A</td>
<td>Yes</td>
<td>12</td>
<td>Weak</td>
<td>2/8</td>
</tr>
<tr>
<td>Electronic Portfolio B</td>
<td>Yes</td>
<td>3</td>
<td>Weak</td>
<td>1/8</td>
</tr>
<tr>
<td>Midterm Test</td>
<td>Yes</td>
<td>18</td>
<td>Weak</td>
<td>4/6</td>
</tr>
<tr>
<td>ThinkQuest Project A</td>
<td>No</td>
<td>0</td>
<td>-</td>
<td>0/8</td>
</tr>
<tr>
<td>ThinkQuest Project B</td>
<td>Yes</td>
<td>6</td>
<td>Weak</td>
<td>2/8</td>
</tr>
<tr>
<td>Library/Media Center Quiz</td>
<td>Yes</td>
<td>4</td>
<td>Weak</td>
<td>0/2</td>
</tr>
<tr>
<td>Assistive Technology Quiz</td>
<td>Yes</td>
<td>2</td>
<td>Weak</td>
<td>0/8</td>
</tr>
<tr>
<td>Computer Labs Quiz</td>
<td>Yes</td>
<td>11</td>
<td>Weak</td>
<td>0/2</td>
</tr>
<tr>
<td>Field Trips-Distance Learning Quiz</td>
<td>Yes</td>
<td>11</td>
<td>Weak</td>
<td>0/6</td>
</tr>
<tr>
<td>Hand Held Devices</td>
<td>Yes</td>
<td>7</td>
<td>Weak</td>
<td>0/4</td>
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<tr>
<td>Summary</td>
<td>15/18</td>
<td>84</td>
<td>Weak</td>
<td>11/122</td>
</tr>
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</table>
Description of Significant Findings for Hypothesis 4

Hypothesis 4

For Hypothesis 4, if there is an interaction between major and gender on academic performance of students in introductory technology courses in the teacher preparation program at WMU. A Two-Way Analysis of Variance methodology was used to test the hypothesis to find the interaction, if any, of educational major and gender on student's academic performance. In the case of further analysis required to determine a significant interaction, a Scheffé Post Hoc test was administered in order to determine the statistical significant interaction between variables.

There were 18 academic measures in the Fall of 2002. The assignments included; total points for the course, various quizzes on course content, two tutorial sessions, and various product assignments (see Table 23). The large majority of the interactions between educational major and gender on academic performance were found not to have significant interaction. Only two product assignments, Electronic Portfolio B and ThinkQuest Project B, were found to have statistical significant interactions between educational major and gender on academic performance (see Table 23).

For Electronic Portfolio B, an individual project for creating a web based portfolio, a statistically significant interaction was found at the .001 level (see Table 23). For ThinkQuest Project B, a team project for creating a web based teaching resource, a statistically significant interaction between
Table 23. F and Significant Values for Gender-Major Interaction on Academic Performance.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>.443</td>
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<tr>
<td>Computer Operations</td>
<td>.789</td>
</tr>
<tr>
<td>Lesson Plan A</td>
<td>1.316</td>
</tr>
<tr>
<td>Dreamweaver Training</td>
<td>.301</td>
</tr>
<tr>
<td>Electronic Portfolio A</td>
<td>1.376</td>
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<tr>
<td>Electronic Portfolio B</td>
<td>10.778</td>
</tr>
<tr>
<td>Midterm Test</td>
<td>.037</td>
</tr>
<tr>
<td>Excel Training</td>
<td>.053</td>
</tr>
<tr>
<td>Lesson Plan B</td>
<td>.634</td>
</tr>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
<td>.150</td>
</tr>
<tr>
<td>ThinkQuest Project A</td>
<td>#</td>
</tr>
<tr>
<td>ThinkQuest Project B</td>
<td>4.457</td>
</tr>
<tr>
<td>Library/Media Center Quiz</td>
<td>.028</td>
</tr>
<tr>
<td>Assistive Technology Quiz</td>
<td>1.067</td>
</tr>
<tr>
<td>Computer Labs Quiz</td>
<td>.123</td>
</tr>
<tr>
<td>Field Trips-Distance Learning Quiz</td>
<td>.041</td>
</tr>
<tr>
<td>Hand Held Devices</td>
<td>1.010</td>
</tr>
<tr>
<td>Total Points</td>
<td>.624</td>
</tr>
</tbody>
</table>

*< .05  **< .001  # cannot be computed because the standard deviation is 0.

educational major and gender on academic performance was found at the .05
level of significance (see Table 23). However, the researcher feels that there are considerations needed for the analysis of these findings. These considerations will be discussed in the next chapter.

From the perspective of the educational major-gender interaction on academic performance, the researcher found very few significant interactions between students' major and gender relative to their academic performance. For this reason, the researcher decided to explore the possibility of finding significant differences with the main effects, educational major and gender, separately. In order to conduct these explorations, the researcher chose to run a t-test for independent samples for each one of the effects. The impact of these interactions on testing the Null Hypothesis 4 will be discussed in Chapter V.

The findings for Hypothesis 4 do not support that there is an interaction between major and gender on academic performance of students in the introductory technology courses.

Description of Significant Findings for Hypothesis 2

**Hypothesis 2**

For Hypothesis 2, if there is a difference in the academic performance of students in regular education and of those in special education majors in introductory technology courses in teacher preparation programs at WMU. A t-test for independent samples was used to find differences, if any, between academic performance of students in the EDT 347 in relation to their educational majors. There were 18 academic measures in the Fall of 2002. The assignments included; total points for the course, various quizzes on various
contents, two tutorial sessions, and various product assignments (see Table 24). All but one of the comparisons between mean values of students in general education and special education were found to be not significantly different. The mean value of the one comprehensive score, Total Points, was also found not to be statistically different. Only one product assignment was found to have significant differences between general and special education at the .05 level of significance. For Electronic Portfolio B, an individual project for creating a web based portfolio, special education significantly outperformed general education at the .05 level of significance.

Table 24. Mean scores for academic performance of students in general and special education during the Winter and Fall semesters of 2002.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regular Education</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>99.48</td>
</tr>
<tr>
<td>Computer Operations</td>
<td>73.23</td>
</tr>
<tr>
<td>Lesson Plan A</td>
<td>91.97</td>
</tr>
<tr>
<td>Dreamweaver Training</td>
<td>24.48</td>
</tr>
<tr>
<td>Electronic Portfolio A</td>
<td>73.51</td>
</tr>
<tr>
<td>Electronic Portfolio B</td>
<td>71.03</td>
</tr>
<tr>
<td>Midterm Test</td>
<td>199.28</td>
</tr>
<tr>
<td>Excel Training</td>
<td>24.65</td>
</tr>
<tr>
<td>Lesson Plan B</td>
<td>93.46</td>
</tr>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
<td>94.43</td>
</tr>
<tr>
<td>ThinkQuest Project A</td>
<td>50.00</td>
</tr>
</tbody>
</table>
Fall 2002

<table>
<thead>
<tr>
<th>Assignment (continue)</th>
<th>Regular Education</th>
<th>Special Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThinkQuest Project B</td>
<td>143.21</td>
<td>142.32</td>
</tr>
<tr>
<td>Library/Media Center Quiz</td>
<td>19.30</td>
<td>20.02</td>
</tr>
<tr>
<td>Assistive Technology Quiz</td>
<td>18.81</td>
<td>19.17</td>
</tr>
<tr>
<td>Computer Labs Quiz</td>
<td>19.46</td>
<td>19.54</td>
</tr>
<tr>
<td>Field Trips-Distance Learning Quiz</td>
<td>16.85</td>
<td>16.47</td>
</tr>
<tr>
<td>Hand Held Devices</td>
<td>20.14</td>
<td>19.23</td>
</tr>
<tr>
<td>Total Points</td>
<td>1186.79</td>
<td>1203.06</td>
</tr>
</tbody>
</table>

*<.05

From the educational major perspective the researcher found only one case that showed differences between students in the general and special education programs when comparing various measures of academic performance. There are intervening elements that need to be considered when analyzing these results. The characteristics of these findings will be discussed in the next chapter.

The findings for Hypothesis 2 support the Null Hypothesis that there is no difference in academic performance between students in general education and students in special education in the introductory technology courses.

Description of Significant Findings for Hypothesis 3

Hypothesis 3

For Hypothesis 3, if there is a difference in the academic performance
of male and female students in introductory technology courses in teacher preparation programs at WMU. A $t$-test for independent sample was used to find differences, if any, between the academic performance of students in the EDT 347 course in relation to their gender.

Table 25. Mean scores for academic performance of male and female students during the Winter and Fall semesters of 2002.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Winter 2002</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Digital Divide Paper</td>
<td>51.24</td>
<td>50.47</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>49.88</td>
<td>49.93</td>
</tr>
<tr>
<td>Computer Operations</td>
<td>36.00</td>
<td>35.96</td>
</tr>
<tr>
<td>Lesson Plan A</td>
<td>46.18</td>
<td>45.37</td>
</tr>
<tr>
<td>Dreamweaver Training</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Electronic Portfolio A</td>
<td>75.00</td>
<td>74.60</td>
</tr>
<tr>
<td>Electronic Portfolio B</td>
<td>69.53</td>
<td>70.21</td>
</tr>
<tr>
<td>Midterm Test</td>
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<td>NA</td>
</tr>
<tr>
<td>Excel Training</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson Plan B</td>
<td>50.20</td>
<td>50.62</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Assignment (continue)</th>
<th>Winter 2002</th>
<th>Fall 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Lesson Plan C</td>
<td>42.13</td>
<td>47.05*</td>
</tr>
<tr>
<td>Microsoft Publisher (Newsletter)</td>
<td>50.00</td>
<td>49.34</td>
</tr>
<tr>
<td>Web Site Evaluation</td>
<td>19.38</td>
<td>19.34</td>
</tr>
<tr>
<td>ThinkQuest Project A</td>
<td>75.00</td>
<td>75.00</td>
</tr>
<tr>
<td>ThinkQuest Project B</td>
<td>62.84</td>
<td>67.36*</td>
</tr>
<tr>
<td>Computer Operations Quiz</td>
<td>11.29</td>
<td>10.60</td>
</tr>
<tr>
<td>Library/Media Center Quiz</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Assistive Technology Quiz</td>
<td>20.35</td>
<td>21.78**</td>
</tr>
<tr>
<td>Computer Labs Quiz</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Field Trips-Distance Learning Quiz</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Hand Held Devices</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total Points</td>
<td>703.06</td>
<td>714.82</td>
</tr>
</tbody>
</table>

<.05, ** <.10

There were 15 academic measures in the Winter of 2002 and 18 in the Fall of 2002. There were 13 common assignments for both semesters. The
assignments included; total points for the course, various quizzes on various contents, two tutorial sessions, and various product assignments (see Table 25). The large majority of the comparisons between males and females were found to be not significantly different. The one comprehensive score, Total Points, was also found not to be significant. A few individual academic performance items were found to be significantly different. Three product assignments were found to have significant differences between males and females at the .05 level of significance. In all cases the females outperformed the males. For Lesson Plan A in the Fall of 2002, comparison was not possible for Fall of 2002. For the ThinkQuest Project B females significantly outperformed males. The same comparison for the Winter of 2002 was not found to be significant. For Lesson Plan C for Winter 2002, females significantly outperformed males. The same Assignment, a team project for creating a teaching resource site on the web, females outperformed males in both semesters, Winter and Fall of 2002 (see Table 25).

For a fourth assignment, the Assistive Technology Quiz for Winter 2002, it was found again that females outperformed males at the .10 level of significance. The same comparison for the Fall of 2002 was not significantly different. From the gender perspective the researcher found only few differences between male and female when comparing various measures of academic performance. The characteristics of these differences will be discussed in Chapter V.

The findings for Hypothesis 3 support the Null Hypothesis that there is no difference in academic performance between male and female students in the introductory technology courses.
Summary

This chapter has presented the findings of this study, which explored the relationships between the academic performance and the technology skills of students in introductory technology courses in teacher preparation programs at WMU. The study also explored the interaction between educational major and gender on the academic performance of students in introductory technology courses. No significant relationships or interactions were established by the findings. Further analysis was conducted to find differences in academic performance of students in the introductory technology course in relation to their educational major or gender, separately. Review of the findings for this analysis found no significant differences. Several factors seem to intervene in the nature of these findings. These factors will be addressed in the discussion presented in the next chapter.

Chapter V will present a brief summary of the study. It will provide a discussion of the findings presented in this chapter. It will also present the researchers’ recommendations for future research based on the findings. Finally, it will present a final summary of the study.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter begins by providing an overview of the research problem for this study, the source of research data, and research methods used for the analysis. The most important findings will be reviewed, and conclusions will be drawn based on these findings. Recommendations for further research will be suggested. Finally, a summary of the study will be presented.

Summary of the Study

The primary focus of this research study was to determine if a relationship existed between the academic performance and the technology skills of students in introductory technology courses, EDT 347 and SPED 537. The academic performance in the study was measured through grades students' received in completed assignments in the courses. The technology skills were measured through the responses of the students to the ETPS survey. The study also attempted to determine any interaction between education major and gender on the academic performance of students. Participants were drawn from the introductory technology courses in the teacher preparation program in the College of Education at WMU during the Fall semester of 2001, and Winter and Fall semesters of 2002. Two teacher preparation programs were represented in the study, the general education
program and the special education program. Information on students' technology skills was gathered through the Educational Technology Profiler Survey or ETPS, housed by Profiler on the Internet; and, information on students' grade per assignment was collected from the management systems used in the aforementioned courses.

Data were collected, coded and entered into the Statistical Package for Social Science (SPSS 11.5.0, SPSS, 2002) software program on the researcher's personal computer. Statistical analysis was done using Pearson product-moment correlation, Two-Way ANOVA, and eventually a t-test for Independent Samples to test the null hypotheses. Even though, a few significant correlations, interactions, and differences were found to be statistically significant, a total of four null hypotheses were tested and none were rejected at the .05 level of confidence.

Discussion of Significant Findings and Conclusions Related to Research Questions

Research Question 1

Research Question 1, explored if there is a relationship between academic performance and the technology skills of students in the introductory technology courses in teacher preparation programs at Western Michigan University. One hypothesis was drawn of this research question. Analysis of data suggested that the relationship between academic performance and the technology skills does not exist. In the revision of the literature, no other studies were found which specifically explored a relationship between these types of variables. Although, findings suggest no
relationship exist related to academic performance and technology skills of students in teacher preparation programs, this research analysis adds to the body of literature, considering the unique conditions under which this study took place.

There is a set of peculiar elements that played an important role in these findings. There were also serious limitations to this study related to the collection of the data. Data was lost in the process of collection, causing important changes in terms of the population and sample for the study. There was not an appropriate representation of students in the special education program. For this reason, other sections of the EDT 347 course were added to the study, for the Winter and Fall semesters of 2002.

The grading system agreed upon and used by the instructors in the EDT 347 course for all semesters involved in the research study was another intervening factor in the study findings. As explained in Chapter 3 in the grading system for some assignments (i.e. ThinkQuest Project A) instructors would give the total points previously allocated to the assignment just for the completion of the task, no measure of the quality of work was involved. This created a very particular distribution of the scores (i.e. scores for all participants are found at the same level, almost with no variance) because all students were awarded the same grade. These data behaved as a constant when statistical analysis was performed using the SPSS program. In this case, calculations could not be performed because the standard deviation was zero.

In other cases, students in the course had the opportunity to remediate their work and get the total amount of points previously assigned to it. This also created a similar situation to that described in the previous example.
There was limited variance in the distribution of grades to be able to get any statistical significance and to find any relationship between these variables. From the statistical perspective, the power in the study is affected when there is a low group variance on the dependent variable (Gay, 1996), which is the case for many of the academic performance assignments. In these cases calculations were performed with the majority of the results showing “weak” or no correlations.

As noted in the previous Chapter Findings, a number of correlations were found between assignments and ETPS Clusters or Items in the Winter semester of 2002. There were a total of 14 assignments, only two of the assignments were not found to be statistically significant, Computer Operations and Concepts Quiz, and ThinkQuest Project A when correlated with ETPS Cluster scores and Items. The author developed 105 relationships between the academic performance items (class assignments and grades) and ETPS Clusters and individual Items. From the 105 predetermined relationships only 33 of them were found to be statistically significant (see Table 13).

Among the assignments found to be as significantly correlated, the Publisher assignment was the only one that correlated with all predetermined ETPS Clusters and Items (2/2), although the correlations were “weak” to “mild” in nature. The ThinkQuest Project B assignment correlated with five out of the eight ETPS Clusters and Items previously determined by the researcher, all of them of a “weak” nature. The last assignment to be highlighted is the Computer Operations and Concepts Quiz which had a total of 11 statistically significant values and ten out of those were predetermined
by the researcher as related to ETPS Clusters and individual Items, all of them of a "weak" nature. Very few significant correlations for the rest of the assignments were found with the predetermined ETPS Clusters or Items. The nature of all of these correlations were of a "weak" to "mild" nature with only one of them, TaskStream Lesson Plan B assignment reaching the "moderate" level (p = .496). These correlations were not strong enough for the researcher to be able to conclude that there really is a positive relationship between academic performance and the technology skills of students as measured by the ETPS survey.

For the Fall semester of 2002, there were a total of 18 academic performance assignments. Three of the assignments Microsoft Publisher (Newsletter), Excel Training, and ThinkQuest Project A, were found to be not significantly correlated with ETPS Cluster scores and Items. Only 11 of the 122 predetermined ETPS Clusters and Items were found to be significantly correlated (see Table 22). None of the assignments significantly correlated with all of the predetermined ETPS Clusters and Items. PowerPoint, Computer Operations, TaskStream Lesson A and Lesson B were also found to negatively correlate to individual ETPS Items. The Midterm Test correlated with four out of the six predetermined ETPS Clusters and Items. Very few significant correlations were found for the rest of the assignments (see Table 22).

For the Fall semester of 2002 there were several negative correlations found when positive correlations were expected. From the information gathered from instructors and the research data, the researcher only perceived minor differences between the way the courses were offered for the
Winter and Fall semesters of 2002. These differences may not necessarily explain the direction of these correlations. The main differences between these semesters are that two of the five instructors were new in the Fall semester and there were small differences in assignments. Most of the course changes focused on the format of the assignments thus keeping the essence of the assignments intact.

Another limitation that the researcher suspected had an impact in the findings of the study was the self-rating component of the ETPS survey and the possible over-rating aspect linked to social desirability responses. An impact of this type has been well documented in the literature (Snir & Harpaz, 2002; Cassel, & Sigelman, 2001; Hancock & Flowers, 2001; Lautenschlager & Flaherty, 1990). Cassel & Sigelman (2001), in their study "Misreporters in candidate choice models," they report that misreporters have a little impact on the results of turnout models. In the same study, Katosh & Traugott, and Sigelman indicate that misreporters might have a little impact on the results of candidate choice models as well (as reported in Cassel, & Sigelman, 2001). In the conclusions of their own study, Cassel & Sigelman (2001) report that misreporters have the ability of confusing the results drawn from the analysis. In other words, misreporters confuse matters by causing some effects to be overestimated and some others to be underestimated.

Hancock & Flowers (2001) tend to agree with the facts found by Cassel & Sigelman (2001). Although, in this study, the authors relate their study to the anonymity of the information requested as well as the location where participants take the survey. They report that it does make a difference when participants know if they can be identified (Cassel & Sigelman, 2001).
Participants' responses are generally overrated, generally, linked to the social desirability. Social desirability bias is when participants are unwilling to admit, or to report accurately and candidly, behaviors or attitudes that in some form deviate from the norm or do not reflect the norm and consequently are not considered acceptable (Folz, 1996). In a study conducted by Nederhof, the author claims, "social desirability is the most common sources of bias affecting the validity of experimental and survey research findings" (as reported in Snir & Harpaz, 2002, p.636). In this study, the distribution of responses was observed and it was noticed a clear tendency of participants to score themselves toward the strongly agree side of the Likert scale. The "weak" correlations found in this study could be the result of students overestimation of their technology skills on the ETPS survey.

An additional finding in relation to the Winter semester of 2002, relative to the ETPS, comes from the Cronbach Test for reliability. The result from the Alpha (Cronbach) Test for the Winter semester of 2002 for the pretest items was an Alpha level of .9309 and for the post-test an Alpha level of .9403. These findings represent a high internal consistency of the ETPS scale a whole. The result from the Alpha (Cronbach) Test for the Fall semester of 2002 for the pretest items was an Alpha level of .9492 and for the post-test an Alpha level of .9419. This again represents a high internal consistency and reliability for the ETPS has been determined to be high.

In the analysis of the findings to answer the first research question, the researcher faced a number of considerations. The considerations included 1) the "weak" nature of the correlations found to be significant between the
academic performance and the ETPS Cluster scores and/or Items; 2) the grading system on some of the assignments in the courses, limiting the variance in the variable; 3) the small changes in the course because of new instructors and the small differences in the assignments might have affected the direction of the correlations; and 4) the possible overrating factor in students responses to the ETPS may have reduced the power of the correlations. The aforementioned considerations in the analysis conducted for both semesters Winter and Fall of 2002 to test the Hypothesis drawn of this question, limits the power of the statistical tests and leaves too many unanswered questions. Thus, the researcher cannot reject the Null Hypothesis that there is no relationship between academic performance and the technology skills of students in the introductory technology course in teacher preparation programs at WMU. Based on the finding of this study, the answer to the first research question is that there is no relationship between the academic performance and the technology skills of students in the introductory technology courses in the teacher preparation program at WMU.

**Research Question 2**

Research question 2, explored if there is an interaction between education major and gender on the academic performance of students from introductory technology courses in teacher preparation programs at Western Michigan University. Three hypotheses were drawn of this research question. These analyses were conducted using the sample from the Fall semester of 2002 which contained students from both education majors. This section of the EDT 347 was the only one that would meet all selecting criteria previously
established by the researcher. Analysis of the data suggested that the interaction between education major and gender on academic performance does not exist. In the review of the literature, the researcher did not find other studies conducted under similar conditions exploring the interaction between these two types of variables. Although, these findings suggest that no interaction exist between education major and gender relative to academic performance of students in teacher preparation programs, the researcher feels that this study still adds to the literature, taking into account the conditions under which the study took place and the topic being studied.

In general terms, there was no significant interaction between education major and gender on the academic performance of students in the introductory technology course EDT 347 for the Fall semester of 2002. Out of the 18 assignments studied only two significant interactions were found for the academic product assignments Electronic Portfolio B at the .001 level of significance, and ThinkQuest Project B at the .05 level. A discussion on these findings follows. However, these findings were not accepted because of problems with the distribution of the sample. In the sample there were 1) a very small number of males in special education (only four out of 37 students total), and 2) a large difference in sample size exist between males and females (only 24 males to 164 females) (see Table 26).

Electronic Portfolio B

Electronic Portfolio B, an assignment where students fully complete a six-page interlinked student portfolio, is an individual project. The statistical test Two-Way ANOVA found that there is a statistical interaction. The researcher did an analysis of the individual means per group (see Table 26). The results
show that the special education males ($\chi = 88.00$) performed better than the special education females ($\chi = 73.79$), and the males ($\chi = 71.05$) and females ($\chi = 71.03$) in the general education group (see Table 26).

The researcher looked at the distribution of the research sample in terms of gender (i.e. the size of the sample in each category). From the statistical perspective the sample size has an impact, an insufficient number of subjects affects the power of the study and that power refers to the statistical ability to reject a false null hypothesis. In other words, when the sample is too small, the researcher may lack the power to reject a null hypothesis even if it is false (Gay, 1996). Therefore, one cannot accept these findings. The rejection of this finding is based on the very small number of special education males ($N=4$,) and on the large difference in sample size between males ($N=24$) and females ($N=164$) (see Table 26).

Table 26. Mean and N scores of male and female for the Electronic Portfolio B in both education majors for the fall of 2002.

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Males &amp; Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi$</td>
<td>N</td>
<td>$\chi$</td>
</tr>
<tr>
<td>General Education</td>
<td>71.05</td>
<td>20</td>
<td>71.03</td>
</tr>
<tr>
<td>Special Education</td>
<td>88.00</td>
<td>4</td>
<td>73.79</td>
</tr>
<tr>
<td>Total</td>
<td>71.03</td>
<td>24</td>
<td>164</td>
</tr>
</tbody>
</table>

ThinkQuest Project B

ThinkQuest Project B, a presentation of the final resource web site, is a
team assignment. The statistical test Two-Way ANOVA found that there is a statistical interaction. The researcher did an analysis of the individual means per group (see Table 27). The findings show a significant difference for male students ($\chi=135.32$) in general education underperforming females ($\chi=144.56$) in general education and males ($\chi=146.75$) and females ($\chi=141.79$) in special education.

Table 27. Mean and N scores of male and female for the ThinkQuest Project B in both education majors for the Fall of 2002.

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Males &amp; Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi$</td>
<td>N</td>
<td>$\chi$</td>
</tr>
<tr>
<td>General Education</td>
<td>135.32</td>
<td>22</td>
<td>144.56</td>
</tr>
<tr>
<td>Special Education</td>
<td>146.75</td>
<td>4</td>
<td>141.79</td>
</tr>
<tr>
<td>Total</td>
<td>146.75</td>
<td>26</td>
<td>141.79</td>
</tr>
</tbody>
</table>

There is a similarity to these findings with those described for the Electronic Portfolio B assignment. The sample size and distribution of subjects by gender is thought to be a possible limitation in the findings (see Table 27). Because of the large number of females in the study there is a likelihood that more teams are made up of more female students. Unfortunately, the researcher could not identify the make up of the teams to be able to find differences, if any, between genders. From the statistical perspective, as explained before when discussing electronic Portfolio B assignment, the sample size has an impact on the power of the statistical test and its relation to the statistical ability of rejecting a false null hypothesis (Gay, 1996). In the distribution of the sample there were only four males in
the special education group and 22 females versus 22 males and 129 females in the general education major, respectively (see Table 27). The findings are not accepted again because of the large distortion in group sizes.

When education major is considered separately there is no significant difference in academic performance between general education and special education in the introductory technology courses. The t-test for independent samples found only one significant difference out of the 18 assignments studied. The Electronic Portfolio B assignment found special education students outperforming the general education students (see Table 24). These results might be hinder by the fact that there were significantly less students in special education (N=37) than the students in general education (N= 151).

When gender is considered separately there is no significant difference in academic performance between male and females in the introductory technology courses. The t-test for independent samples found three out of the 15 assignments studied in the Winter semester of 2002. For the four academic measures were gender difference was found females outperformed males in all cases. In the Fall semester of 2002, only two assignments out of the 18 studied were found to be significantly different. In both cases females outperformed males. The limited findings in this area could be related to the grading system in place for the courses caused by the pass/failed mode, as well as, by letting the students remediate their assignments. Also, it could be related to the size and distribution of the sample, in this case the statistics becomes less sensitive to detect differences between variables (Schloss & Smith, 1999) (see Table 25).

Only one variable ThinkQuest project B assignment was found to be
significantly significant for both semesters. As regards to the ThinkQuest Project B assignment which was found to be statistically significant for education major, the gender make up of the teams for this assignment was not specified in the study. The majority of students in the course were females and it could be assumed that the majority of the teams were made up of all-female students. As part of the assumption, these all-female student teams seemed to outperform male-female teams or all-male teams. Future studies looking at academic performance of technology skills might control for gender differences and team make up.

In relation to the second research question if there is an interaction between education major and gender on the academic performance, findings to Hypothesis 4 looking for interaction, cannot reject the Null Hypothesis that there is no interaction between education major and gender on the academic performance of students in the introductory technology course in teacher preparation programs at WMU. Findings of Hypothesis 2 looking for differences between education majors cannot reject the Null Hypothesis that there is no difference in academic performance between students in general education and students in special education in the introductory technology courses. Lastly, findings to Hypothesis 3 looking for differences in gender cannot reject the Null Hypothesis that there is no difference in academic performance between male and female students in the introductory technology courses. Based on these findings the answer to the second research question is there is no interaction between education major and gender on the academic performance of students in introductory technology courses in the teacher preparation program at WMU.
Recommendations for Further Research

Based on the findings and conclusions of this research study, several recommendations for future studies were raised. The relationship between academic performance, scores on assignments in the courses and technology skills of students, measured by the ETPS in introductory technology courses in teacher preparation programs has not been documented previously in the literature. The findings of this study are thus considered preliminary and suggest that additional studies with a larger and better represented sample, in terms of education major need to be considered. One would naturally expect a relationship between the ETPS and related assignments if the Profiler survey were a reliable instrument to measure technology skills. This study did not find that relationship and calls into question the use of the Profiler survey to document the academic performance.

Researchers need to look at other measures of academic performance since the measures of academic performance in this study were found to be poor measures and limited the statistical analysis. Instructors in introductory technology courses should maintain a comprehensive record of progressive grades assigned to students to document the progression of change as well as the final grade, and provide the appropriate data for statistical analysis if necessary. Also, instructors may consider to maintain a locked arrangement for the course, in terms of assignments, grading system, teaching practices and instructors, for at least one or two years. This will allow researchers to compare groups and establish relationships and differences, if any, between academic performance and technology skills, considering education major and gender of students participating in the course. It would be interesting, in
terms of replicating this study or conducting a similar one, to consider using the first score given to the students for their accomplishments in the different assignments before providing opportunities for remediation and reaching the maximum number of points. This may provide a better variance in the scores and might provide better results from the statistical analysis.

It is further recommended that the Educational Technology Profiler Survey be item analyzed to minimize the response error. The ETPS Items generally asks for several academic performance tasks. This issue needs to be addressed for the instructors to know what the response refers to. One suggestion given by the author is to divide the survey in seven sections, each one relating to the six ISTE standards and the AT section. Develop each section as a new survey that considers all requirements from ISTE. In the administration of the survey to students in the course, the surveys are presented throughout the semester, as ISTE standards are being addressed in the course. The students are asked to complete the survey at the beginning and at the end of each ISTE Standard as it is presented to the course. Surveys should be kept short to make sure students participate fully. The researcher believes that this will help in controlling response errors coming from double-barrel questions, separate questions combined into one and asking for a single response (Dillman, 1978).

Future research, related to students in introductory technology courses in teacher preparation programs, needs to be conducted to better understand the impact of education major and gender on academic performance, as well as the relationship between academic performance and technology skills. In addition, future studies should be designed to examine the reliability of the
Educational Technology Profiler Survey as a method of gathering information in teacher preparation programs at the national level, working with all institutions that are using the ETPS.

Summary

This study has explored the relationship between the academic performance and the technology skills of students and found no relationship. It also explored the interaction between education major and gender on academic performance and found no interaction. All explorations were made in the context of the introductory technology courses in teacher preparation programs at Western Michigan University.

Although the current study presents valuable information, at least two limitations should be noted. First, the sample represents preservice teachers from one university; therefore, findings may not be generalizable to larger populations of preservice teachers. Second, data were collected using a self-report measure. Therefore, we cannot be certain that the information represents preservice teachers' actual technology skills. In general, findings from this study suggest the Educational Technology Profiler Survey is a reliable instrument to gather information on technology skills; its relationship with the students' academic performance has yet to be documented.
Appendix A

Human Subjects Institutional Review Board Approval
Date: September 25, 2001

To: Howard Poole, Principal Investigator
   Carmen Comieles, Student Investigator for dissertation

From: Mary Lagerwey, Chair

Re: HSIRB Project Number 01-08-17

This letter will serve as confirmation that your research project entitled "PT_3 Grant Evaluation" has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: September 25, 2002
Date: February 28, 2002

To: Howard Poole, Principal Investigator
    Carmen Cornieles, Student Investigator for thesis

From: Mary Lagerwey, Chair

Re: Changes to HSIRB Project Number: 01-08-17

This letter will serve as confirmation that the changes to your research project “Reliability of the Educational Technology Profiler Survey as a Method of Gathering Information in Teacher Preparation Programs (changed from PT_3 Grant Evaluation)” requested in your memo dated February 27, 2002 have been approved by the Human Subjects Institutional Review Board.

The conditions and the duration of this approval are specified in the Policies of Western Michigan University.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: September 25, 2002
Date: March 31, 2003

To: Howard Poole, Principal Investigator
Carmen Comieles, Student Investigator for dissertation

From: Mary Lagerwey, Chair

Re: HSIRB Project Number 03-03-24

This letter will serve as confirmation that your research project entitled “Reliability of the Educational Technology Profiler Survey as a Method of Gathering Information in Teacher Preparation Programs” has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: March 31, 2004
Appendix B

Script to Present Study to Students
Hello, My name is Carmen Cornieles. I am a doctoral student in the department of Educational Studies, Special Education Program. I am working on my doctorate degree. In order to finish this degree I have to conduct a research study. The study I am working on is "Reliability of the Educational Technology Profiler System as a method of gathering information in teacher preparation programs." In this study, I would like to use the grades you received by assignments on this course, and survey items in the Profiler survey you completed at the beginning of class and will complete at the end of the semester. I will correlate this information to see how reliable the instrument is in reflecting your level of competency in completing the assignments. Today, I am here to ask you to volunteer as a subject for my study.

If you agree to volunteer, the data from your Profiler surveys and your Blackboard assignments will be collected by Ms. Anna Lee Miller, a neutral person, who is not involved in the study. Ms. Miller will remove all personal information from the data and save it until after grades are submitted at the end of this semester. Once all this is done, the data will be transferred to Dr. Poole and myself to complete the study. The data will have no names attached to it, so there is no way the researchers will know who agreed to volunteer and who did not. It will in no way affect your grade in the class.

I am handing you a letter of consent that explains your degree of participation. Please, make sure that you have read it, sign and check the appropriate box to either use your class data or to not use it for my study. This letter will be collected and put in a sealed envelope to be handed to Ms. Miller who is going to recode the information at the end of the semester, so that no personal information is attached to it.

Are there any questions? Dr. Poole and I are willing to answer any question you may have in relation to the study.

I want to thank you for your time and collaboration in my study. I want you to know that an executive summary of the study will be available once the study is completed. It will provide information on the study and its findings.
Appendix C

Subject Consent Form
Reliability of the Educational Technology Profiler System as a method of gathering information in teacher preparation programs.

Dr. Howard Poole, Principal Investigator
Ms. Carmen Cornieles, Student Investigator

Dear Student,

My name is Carmen A. Cornieles. I am a Doctoral Associate in the Special Education Program, housed in the Department of Educational Studies at this university. I will be conducting a research study for my dissertation, the last of requirements to complete my Doctorate Degree. The nature of the study is to determine the reliability of the self-reported Educational Technology Profiler System in a correlational study as it relates to performance on class assignments completed in introductory technology courses in the College of Education. The purpose of the study is to provide information for teacher preparation program improvement, specifically in introductory technology courses. This study will run from October, 2001 until May, 2002.

Your participation, once you agree to it, will be minimal but crucial in the development of the study. In the course that you are enrolled, you have a requirement to complete the Profiler questionnaire at the beginning and at the end of the semester. By completing this questionnaire you become eligible to participate in my study. A total of 120 students, out of those who volunteer, will be randomly selected as the sample for the study. To take the Profiler is required for your course not for the study. Another requirement you have in the course is to use Blackboard to submit your assignments. It is important to clarify that by signing this document you agree to have your data used for research.

Data from the Profiler surveys and assignments scores from the Blackboard management system will be collected by non-instructional personnel from the PT3 project (Ms. Anna Lee Miller), recoded to protect the identity of individual students, and then transferred to the researchers for analysis. All personal identifying information will be removed from the data prior to analysis by researchers. Ms. Miller will match signed consent documents to the data before handing the data to the researchers. Dr. Poole and I, who are instructors in the courses, will not know who the data belongs to and thus all students will be protected, both volunteers and non-volunteers.

Data for the study will not required any extra time or inconvenience for you. There are no known risks to you as the participants. As students, you will not miss out on scheduled course content. The time spent in the study should not be an inconvenience to you in anyway. As a participant you always have the choice to withdraw your consent to the research or discontinue participation at any time without prejudice, penalty, or risk of any loss of services you otherwise have.
Among the benefits from the study, I can say that it may provide you with valuable information on your technology skill development during the course. At the same time, by validating the reliability of this instrument, participants who will use it in the future will have a stronger tool to measure their technology skills development. It may also improve the quality of introductory technology courses in the teacher preparation programs in the College of Education at this university.

If you have any questions or concerns regarding the use of the Educational Technology Profiler System you may call Dr. Howard Poole and/or Ms. Carmen Corniesles, instructors of the ED 347 and SPED 537 courses at 616 387-6050; Dr. Elizabeth Whitten, Chair of the Department of Educational Studies at 616 387-5940; the Office of the Vice President for Research at Western Michigan University at 616 387-8293; or the Human Subjects Institutional Review Board at Western Michigan University at 616 387-8293.

My signature below indicates that I have read and/or had explained to me the purpose and requirements of the study and that I agree to have my Profiler questionnaires and Blackboard assignments used as data.

This consent document has been approved for use for one year by the Human Subject Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Subjects should not sign this document if the corner does not show a stamped date and signature.

__________________________  _______________________
Signature                           Date

Please check one of the following:

_____ Please, use my class data for this research.

_____ Do not use my class data for this research.
Appendix D

Educational Technology Profiler Survey
This survey has been designed to assess your skill levels in meeting the National Educational Technology Standards for Teachers. It should provide you with a profile on which educational technology skills you may need to focus on. It should also include a listing of which of your classmates may be able to help you in filling in your educational technology professional development profile. Thank you for completing this survey. You may be asked to take this survey again at the end of the course and/or your program. This may be done to assess the progress in mastering the educational technology professional skills needed to lead a 21st century class room.

1. Start up and shut down the computer; open and close a program; insert and eject a disk or CD-ROM
2. Open a file from a disk or folder and save a file to a disk or folder,
3. Create, copy, move, rename and delete folders,
4. Cut, copy and paste text within a program and between programs,
5. Use formulas in a spreadsheet,
6. Setup computer system and connect peripheral devices,
7. Correct a locked-up computer,
8. Select printers and solve common printing problems,
9. Install/reinstall system software and printer drivers,
10. Install application software,
11. Create and maintain backups,
12. Send, reply and forward email,
13. Send, receive and open email attachments,
14. Download and decompress files/images from the Internet,
15. Scan a document,
16. Correctly define all of the following terminology; LAN, HTML, USB, CD-ROM, and RAM,
17. Develop a multi media presentation using text, graphics, audio and video or animation.
18. Examine technology tools used to collect, analyze, interpret, represent, and
communicate student performance,

19. Create and use favorites in Internet Explorer,
20. Create and maintain a webpage with a webpage editor,
21. Record video footage and import/export to and from computer and video tape,
22. Engage learners in learning practices that lead to new ways of thinking and understanding to creatively construct new knowledge,
23. Choose resources based on alignment with curriculum, appropriateness for target population and ease of use (e.g., know appropriate resources for directed vs. constructed learning),
24. Create a PowerPoint or other electronic presentation,
25. Integrate technology into a standards supported curriculum,
26. Select software that is compatible with institutional supported hardware platforms and software specifications,
27. Merge information from a database into a word processor,
28. Mount a Web page related to a teaching unit or lesson plan,
29. Participate with others in an on-line course, discussions or net meeting,
30. Work with desktop publishing (desktop publishing, reports, PDF files, Web pages),
31. Design and teach technology-enriched learning activities that connect content standards with student technology standards and meet the diverse needs of students,
32. Design, manage, and facilitate learning experiences that affirm diversity and provide equitable access to resources,
33. Analyze and evaluate student work that uses technology (create rubrics for technology-based assessment),
34. Evaluate data (compare and analyze sources of information, determine and cite valid sources using proper bibliographic formatting, observe copyright guidelines and protocols) (can you write a citation from the Internet in APA format?).
35. Use the results from assessment measures (e.g., learner profiles, computer-based testing, electronic portfolios) to improve instructional planning, management, and implementation of learning strategies.
36. I am able to use advanced features of a word processor (tables, headers and footers, macros, table of contents, columns, etc.).
37. Create a graph from spreadsheet data,
38. Create a report (query/find request) in a database and sort the results,
39. Send e-mail messages and send/receive attachments,
40. Subscribe and unsubscribe from a mailing list (listserv),
41. Reduce, enlarge, or crop a graphic and convert graphics from one file format to another,
42. Understand the process for entering information as required by administrative system,
43. Use templates or appropriate software for grading, budgeting, and maintenance requests,
44. Accommodate the special needs of students for inputting and accessing information,
45. Discuss health and safety issues related to electronic media,
46. Examine acceptable use policies for the use of technology in the schools and classroom, including strategies for addressing threats to security of technology systems.
data, and information,

47. Advocate for equal access to technology for all students in their schools, communities, and homes,

48. Evaluate data, comparing and analyzing sources of information, observe copyright guidelines and protocols.
Survey: Revised Ed347 Technology Survey

User:
You last took this survey on

Share survey results within your building? ☑

This survey is designed to help ED347 students identify their educational technology skills. The survey will be taken before and at the end of the course. Students will be able to see a profile of their technology skills in six areas and compare their skills with the class average. The skill areas are linked to the ISTE NETS Standards for Pre-service Teachers and to content and course activities in ED347. Ask your instructor if you have any questions concerning this survey.

1. I can start up and shut down a computer, open and close a computer application, and insert and eject a diskette or CD-ROM disk.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

2. I can open a file from the diskette or a folder/directory as well as save a file to a diskette or folder/directory.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

3. I can use a word processing program to cut, copy, and paste text within a document and between documents and/or computer applications.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

4. I can update an operating system or computer application when a new version arrives on a CD-ROM.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

5. I can connect various devices to a computer using appropriate cables such as a printer and/or a video projector.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

6. I know the common terms used to describe the basic hardware units of a personal computer such as memory, internal devices, storage units, etc.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

7. I can develop a multimedia presentation that incorporates text, graphics, audio, video and/or animation.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

8. I can use computer applications to collect, store, analyze, and represent student academic performance.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

9. I can design and create web pages that include text, graphics, hyperlinks to other internet resources, and navigational links.
   1 ☑ Strongly Disagree  2 ◊ Disagree  3 ◊ Not Sure  4 ☑ Agree  5 ☑ Strongly Agree

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10. I can use a lesson planning tool to create an instructional activity that includes educational goals/objectives, lesson resources, links to standards, and directions for conducting the lesson.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

11. I can search the Internet to locate resources for a teaching activity and then create a "hotlist" for students to use to complete the activity.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

12. I can create a lesson plan that integrates the use of computer applications and that teaches students various technology skills based on recognized national technology standards.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

13. I can design a lesson plan that uses a spreadsheet program (such as Excel) to store data and to create graphic images such as charts or graphs.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

14. I can plan a web teaching resource site that provides resources and directions to other teachers and students for learning about various content topics and/or technology skills.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

15. I have designed a lesson plan that incorporates content standards (i.e. such as Michigan Benchmarks) with various forms of technology standards (such as the ISTE NETS standards).

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

16. I have created a lesson plan that includes web quest or other form of virtual tour of a location, environment, or concept.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

17. I can find resources on the World Wide Web that can be used to illustrate concepts in a technology integrated lesson plan.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

18. I know how to work with a media specialist to create library book lists and to use their services to teach classes using various forms of technology.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

19. I have formally evaluated a website as a teaching resource using a variety of questions.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

20. I have used a "rubric" tool to create a scoring rubric for a lesson plan to analyze and evaluate student work that includes use of technology.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

21. I have used online surveys and online quizzes as part of structured learning activities to evaluate my knowledge and skill levels.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree

22. I have created a spreadsheet data collection template for students to use to collect and analyze various forms of data.

   1 C Strongly Disagree  2 C Disagree  3 C Not Sure  4 C Agree  5 C Strongly Agree
23. I have created an evaluation method where students create a multimedia product (such as a Power Point slide show or Inspiration diagram) to demonstrate what they have learned.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

24. I have used video technology to record and evaluate the achievement of students.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

25. I have created a web-base portfolio that reflects my personal and professional interests as an elementary education major.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

26. I have identified web sites that provide professional resources for teachers and have included those web sites in lesson plans, and/or on online web sites.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

27. I have used multimedia tools to create a product that describes, in part, who I am as a person and as a professional.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

28. I have used a technology tool to create a resume that summarizes of my professional work or achievements.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

29. I have prepared a newsletter that can be used to communicate with students, parents, and/or other teachers topics and issues related to my personal or professional work.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

30. I have used email and other forms of electronic communications to interact and exchange information regarding personal and professional activities.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

31. I can prepare a short essay on issues dealing with the "Digital Divide".

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

32. I am familiar with the "acceptable use policies," such as Western's Student Personal Web Page Rules.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

33. I am aware of possible health and safety issues related to the use of computers and electronic media.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

34. I am aware of filtering devices that prevent student access to pornographic materials on the web.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

35. I am aware of software programs that screen student assignments for inappropriate referencing and citations.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

36. I have knowledge of tools to assist individuals with disabilities to better use a personal computer.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree
37. I have used methods for evaluation of web sites for their level of accessibility by individuals with disabilities.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

38. I have knowledge of adaptive keyboard devices to help individuals with disabilities use computers, run programs, and input information.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

39. I have used software that has "text to speech" capability that could be used to help students who have learning disabilities.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree

40. I have seen demonstrated screen modification programs that make it easier for students with visual impairments to use the computer.

1 Strongly Disagree 2 Disagree 3 Not Sure 4 Agree 5 Strongly Agree
Appendix E

Syllabi for the Courses in the Study
Course Description (WMU Undergraduate Catalog 1999-2001):

An introduction to the contributions of instructional technology to learning and teaching in elementary education. The course will provide a survey of critical use of technology appropriate (for meeting or exceeding the ISTE National Educational Technology Standards for Teachers.) This will enable students to acquire basic skills in producing and using computers, video and other instructional technologies in educational applications. Concurrent enrollment with ED 351 is encouraged.

Monday (Call #50145) and Wednesday (Call #15128) Sections
Lectures - Monday - 2304 Sangren Hall (See Schedule)
Lectures - Wednesday - 2305 Sangren Hall (See Schedule)
Computer Labs - 2202, 3204, and 3206 Sangren Hall and METL Lab

(Arranged times - See Schedule)

Instructors: (This course is team taught by six individuals)

Alfredo Aleman, Kalamazoo Public Schools
Nancy Beukema, PT3 Project
Bob Leneway, PT3 Project
Mary Jane Mielke, PT3 Project
Howard Poole, Ed Tech Program and PT3 Project
Craig Thomas, Ed347 Graduate Assistant

Monday Section Instructor of Record -

Alfredo Aleman
Kalamazoo Public Schools
616-387-6050
alfredo.aleman@wmich.edu

Wednesday Section - Instructor of Record -

Howard Poole
Educational Technology Program
Course Office - 3419 Sangren Hall (Office of Dr. Poole)
Course Office Hours - 1-4 PM Monday and Wednesday or by Appointment
Course Web Site - http://www.wmich.edu/pt3/
Course Email - maryjane.mielke@wmich.edu

Required Items:

1. Email Address
2. Registration on Blackboard.com (free)
3. Registration on Taskstream.com ($20.00)
4. Access to a computer with an updated Internet Browser (ie. Version 4.0 or higher of Netscape or 4.0 of Microsoft Explorer
5. Adequate hard drive or other disk space for backups of all of your assignments.
6. Five or more high density 3.5 inch computer diskettes
7. No TEXTBOOK is required!

ED 347 Instructor Biographical Information:

Alfredo Aleman - Alfredo is currently teaching in the Kalamazoo Public Schools at the elementary level. He has considerable experience teaching with the use of technology and has directed teams of teachers as they explored the integration of technology into the Kalamazoo curriculum. He is the instructor of record for the Monday section of Ed347. (Email = alfredo.aleman@wmich.edu)

Nancy Beukema - Nancy has just retired after more than twenty years of teaching special education. She has also just completed her doctorate degree in Special Education Technology and regularly teaches the special education technology course (SPED537). She is currently teaching for Western and working for the PT3 project. (Email = nancy.beukema@wmich.edu)

Robert Leneway - Bob is currently directing the Preparing Tomorrow's Teachers to Use Technology (PT3) Project that begins this year at Western. The federally funded, three year project is designed to enhance the educational technology skills of all undergraduates in the College of Education. Bob will assist ED347 instructors with several elements of the course and will be responsible for gathering information about the technology skills of ED347 students. (Email = bob.leneway@wmich.edu)

Mary Jane Mielke - Mary Jane has recently joined the Preparing Tomorrow's Teachers to Use Technology (PT3) Project as technology resource person to assist student teachers and
mentor teachers with the use of technology in WMU Cluster Site schools as part of the SUPT Collaborative. It is likely that Mary Jane will be available to help ED347 students with using technology when they are student teaching in future semesters. Mary Jane has an extensive history of working with vocational student teachers and has recently moved to the Kalamazoo area from Ohio. (Email = maryjane.mielke@wmich.edu)

Howard Poole - Howard is program director for the Educational Technology Program in the Department of Educational Studies at Western. He regularly teaches technology classes at the graduate and undergraduate level. He is also working part time this year with the PT3 Project. (Email = howard.poole@wmich.edu)

Craig Thomas - Craig has taught classes at Western for several years and is serving as the graduate assistant in Ed347 this semester. He also has extensive experience in using technology for a variety of purposes and currently works as web master for several groups. (Email = craig.thomas@wmich.edu)

Course Goal/Competencies:

The general goal of ED347 is to familiarize undergraduate students studying elementary education with the technologies that are used in many of today's elementary education classrooms. The course will introduce students to several basic computer applications and require that each student demonstrate their competency in using the applications as part of class communications and as part of class assignments. The major components of the class include creating lesson plans that integrate technology into academic subjects using Michigan Academic Benchmark Standards and ISTE Technology Standards for Teachers. These assignments will require use of the Taskstream online lesson planning tool. Another major component of the class is creating a web-based portfolio that will include a home page, resume page, personal page, technology competencies page, and a major/minor page. The final component of the course is the development of a collaborative ThinkQuest professional development or K-8 subject area site for integrating technology into elementary education. Students will work in teams to complete this last assignment.

Course Competencies (Based on ISTE 2000 Technology Standards)

Competency I - Using Email - Students will be required to obtain an email account for use during the course as part of course communication activities. The email address is needed for communications with the ED347 Web-site on Blackboard.com. Students will be required to obtain their own email account through free email services on the World Wide Web such as Hotmail.com or Yahoo.com or through a temporary email account with Western.

Competency II - Using a Web-based Course Management System - Students will be required to enroll in the ED347 course management system provided by Blackboard.com. Students will need to gain a working knowledge of the course management options within the Blackboard system for communications via discussion boards and email. Assignment evaluations (points) for assignments will be posted on Blackboard.com. Other announcements about the course will also be posted on the ED347
Blackboard site.

**Competency III - Using the Internet** - Students will be expected to use the Internet on a weekly basis for course related discussion, communications, materials, and resources. Using the Internet will require a working knowledge of a web client such as Netscape Navigator or Microsoft Explorer. These software tools can be found in all WMU computer labs on campus or can be downloaded free from Netscape or Microsoft. Students will be required to evaluate an educational web site as well as prepare items for placement on the Web as part of creating a personal web-base portfolio and as part of a ThinkQuest web site development project.

**Competency IV - Creating Desktop Presentations** - Students will be required to create a Microsoft PowerPoint presentation. The presentation will demonstrate a working knowledge of the PowerPoint software, the use of graphics, and the ability to print a paper copy of the PowerPoint slides.

**Competency V - Creating a Spreadsheet** - Students will be expected to create a simple data collection page on a Microsoft Excel spreadsheet. The assignment will require a working knowledge on introductory spreadsheet formatting and printing commands.

**Competency VI - Web Page Authoring** - Students will be required to create several web pages and a web site using various web authoring tools including creating a personal portfolio site and a collaborative site on Thinkquest.

**Competency VII - Desktop Publishing** - Students will be required to use a common desktop publishing authoring software to create newsletter that can be used by elementary teachers.

**Competency VIII - Use of the Inspiration Planning Tools** - Students will be required to use the Inspiration Software tool to plan a comprehensive lesson. Inspiration software (www.inspiration.com) is a visual learning tool used to assist with the development of ideas and to organize thinking by individuals and small groups.

**Competency IX - Integration of Technology into Lesson Plans** - Students will be required to use the TaskStream Curriculum Builder Lesson Planning tool to create three lessons that integrate Michigan Academic Benchmark Standards and ISTE Technology Standards. The lesson planning assignments also require the creation of scoring rubrics using the Taskstream Rubric Wizard.

**Competency X - ThinkQuest Web Site Development** - Students will be expected to work in teams to create a professional development or K-8 subject area site that could integrates Internet technology into the classroom. The ThinkQuest model uses a collaborative learning model that includes participants from the ED347 course as well as others outside the class. The common product of the ThinkQuest model is an online of web resource site for teachers and other lesson planning idea for their students.

**Competency XI - Hands-on Experience Using Instructional Technology Equipment** - Students will be expected to demonstrate skill and confidence in using technology related equipment common found in elementary education classrooms including computers, video projection equipment, video conferencing equipment, and other forms of digital electronics.

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Top of Page, Instructors, Course Goals, Course Schedule, Assignments, Grades, Related Items

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5/8/2003
Final Schedule ED347 Fall 2001 (revised 9-3-2001)

Week 1 - August 27 / 29 - Introduce Assignment I - Blackboard, Taskstream, and Profiler -
Digital Divide Paper - Due September 13th
5:30-6:30 Lecture - Labs 6:30 -8:00 (double up students)

Week 2 - Sept 3 (Labor Day Holiday) - Sept 5 (Open Lab on Wednesday 4-7 pm - No Formal Classes)

Week 3 - Sept 10 / 12 - Assignment II - Powerpoint Presentation using Digital Cameras, Scanners, and other multimedia items Due September 21st
Two two-Two Hour Labs 4:00 - 6:00 and 6:30 - 8:30
Thursday, Sept. 13th - Profiler Pre Course Survey Due by 12 midnight
Thursday Sept. 13th - Assignment I - Blackboard-Digital Divide Due by 12:00 midnight

Week 4 - Sept 17 / 19 - Introduce Assignment III - Integrated Lesson Plan A with Taskstream, Hot List, and Web Site Evaluations - Due September 28th
Two labs 4:00 - 6:00 lab, 6:30 - 8:30 lab
Friday Sept. 21st - Assignment II - Powerpoint Due by 12:00 midnight

Week 5 - Sept 24 / 26 - Introduce Assignment IV - Computer Operations/Terminology - Due Oct 5th
Two - Two Hour Labs 4:00 - 6:00 and 6:30 to 8:30
Friday Sept. 28th - Assignment III - Integrated Lesson Plan A - Due by 12:00 midnight

Week 6 - Oct 1 / 3 - Introduction to Assignment V - Student Portfolio, Homepages, Intro to Dreamweaver - Part One - Due October 12th, Part Two Due October 26th
4:00 - 6:00 lab, 6-6:30 lecture, 6:30 - 8:30 lab
Friday Oct. 5th - Assignment IV - Computer Operations Due by 12:00 midnight

Week 7 - Oct 8 / 10 - Introduction to Assignment VI - Assistive Technology and Work on FTP and Dreamweaver Operation (lab)
4:00 - 6:00 lab, 6:00-6:30 lecture, and 6:30 to 8:30 lab
Friday Oct. 12th - Assignment V - Portfolio - Part One (Basic WebSite) - Due by 12:00 midnight

Week 8 - Oct 15 / 17 - Introduction to Assignment VII - Join Thinkquest - Intro to Inspiration - Part One Due Nov 5th or 7th - Part Two Due November 26th or 28th - Work on Profolio
4:00 - 6:00 lab, 6-6:30 lecture, 6:30 - 8:30 lab
Friday, October 19th - Assignment VI - Assistive Technology Due by 12:00 midnight

Week 9 - Oct 22 / 24 - Work on Portfolio (lab)
4:00 -5:30 lab 5:30-6 lecture, 6:30 -8:00 lab
Friday October 26th - Assignment V - Portfolio Part Two (Comprehensive WebSite) - Due by 12:00 midnight

Week 10 - Oct 29 / 31 - Introduce Assignment VIII - Integrated Lesson Plan B with Excel Data Collection

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Two Hour Labs 4:00 - 6:00 and 6:30 to 8:30

**Week 11 - Nov 5 / 7** - Work on Lesson Plan and/or Thinkquest Project - Team Proposal Approved
Two Hour Labs 4:00 - 6:00 and 6:30 to 8:30 with team reports
Monday or Wednesday Nov 5th or 7th - Assign VII Thinkquest Team Reports - Part One Due during Lab

**Week 12 - Nov 12 / 14** - Work on Lesson Plan - Thinkquest Project (lab)
Two Hour Labs 4:00 - 6:00 and 6:30 to 8:30 with team report
Friday November 16th - Assignment VIII Integrated Lesson Plan B Due by 12:00 midnight

**Week 13 - Nov 19** - Thanksgiving NOV 21 Open Lab - No Formal Classes
Open lab on Monday - 4-7:30 pm

**Week 14 - Nov 26 / 28** - Introduction to Assignment IX - Integrated Lesson Plan C with Newsletter and WebQuest, virtual field trip, or distance learning application (two-way video demo)
4:00 -5:30 lab 5:30-6 lecture, 6:30 -8:00 lab

**Week 15 (Finals) Dec 3 / 7** - Schedule Panel Presentations during week
Wednesday, December 5th: Assignment IX - Integrated Lesson Plan C Due by 12 midnight
Friday, Dec. 7th Profiler Post Course Survey Due by 12 midnight
Friday, Dec. 7th Online Course Evaluation Due by 12 midnight
Friday, Dec. 7th "Show and Tell" of Thinkquest Assign VII Part Two Due (team presentation)

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**Summary of Assignments**

Profiler Pre-Course Survey - (Due September 13th)

Assignment I - Digital Divide Paper (Due September 13th)

Assignment II - PowerPoint Presentation (Due September 21th)

Assignment III - Integrated Lesson Plan A (Due Sept 28th)

Assignment IV - Computer Operations/Terminology (Due Oct 5th)

Assignment V - Portfolio Part One (Basic Web Site Friday October 12th)

Assignment VI - Assistive Technology Due October. 19th

Assignment V - Portfolio Part Two (Final WebSite) - Due October 26th

Assignment VII - Thinkquest Proposal Part One (Due Nov 5th or Nov 7th)
Assignment VIII - Integrated Lesson Plan B Due Friday November 16th
Assignment VII - Thinkquest Project Part Two Due December 7th
Assignment IX - Integrated Lesson Plan C Due December 5th
Profiler Post Course Survey - Due December 7th

Summary of Assignment Points
Pre-course Profiler - 10 Points

Assignment I - Blackboard, Taskstream, Digital Divide Paper - 50 Points
Assignment II - PowerPoint Presentation - 50 Points
Assignment III - Integrated Lesson Plan A - 50 Points
Assignment IV - Computer Operations/Terminology - 50 Points
Assignment V - Portfolio Part One - 75 Points
Assignment VI - Assistive Technology - 50 Points
Assignment V - Portfolio Part Two - 75 Points
Assignment VII - Thinkquest Team Part One - 75 points
Assignment VIII - Integrated Lesson Plan B - 50 Points
Assignment VII - Thinkquest Part Two - 75 points
Assignment IX - Integrated Lesson Plan C - 50 Points

Post-course Profiler - 10 Points
Total = 670

Extra credit - Lab Attendance - 12 weeks (4 points week) = 48

Summary of ED 347 Points for Fall 2001
Total Points Available = 670

Nine Assignments = 650

Technology Surveys = 20

Class Attendance Extra Credit = 48

ED 347 Grading Scale

A - 93% - 100% - 670-623 Points
BA - 88% - 92% - 622-590 Points
B - 83% - 87% - 589 - 556 Points
CB - 78% - 82% - 555-523 Points
C - 73% - 77% - 522-489 Points
DC - 68% - 72% - 488-455 Points
D - 63% - 67% - 454-422 Points
E - Below 63% - 421 Points or lower

Other ED347 Related Course Items

Assignment Details

The format of the assignment will be described in detail in each assignment description. Due dates for assignments are on Fridays. Assignments should be submitted before 12:00 midnight on those days via electronic means. Late assignments will lose 20 points for each week they are late. Your name, ED347 section, and the Assignment Name should be included on each assignment. Points awarded for assignments will be posted as soon as possible on the ED347 coursesites.blackboard.com grading system by the ED347 Course Instructors. Questions about grades and assignments should be emailed to Mary Jane Mielke (maryjane.mielke@wmich.edu)

ED347 Computer Lab Schedule

A key component of this course is the use of computer labs to complete assignments and to provide students with the tools and an opportunity to practice the skills needed
to complete the assignments. Students will be expected to spend an hour or more each week using a computer. Students are encouraged to attended lab times as scheduled during first class meeting. Lab times are available for Monday and Wednesdays - 4:00 pm to 6:00 pm and for 6:30 50 8:30 pm in Rooms 2202, 3204, and 3206 Sangren and the METL lab. The Sangren Hall computer labs will also have general open hours each week (normally 8 am to 5 pm). Other University Computer Labs also exist around campus. Students are also encouraged to get access to a personal computer.

ED347 Attendance Policy

Attending lecture and lab classes is seen as a valuable part of completing ED347 successfully. Students will be rewarded with lab attendance with 4 points each week. Each week an attendance sheet will be available. Students will sign their own name to the sheet. It is your responsibility to complete and legible sign the attendance form and to turn it into the lab instructor. The attendance process is also seen by the instructor as a way to gather formal and informal feedback on class activities, assignments, grading issues, etc. An open comment section for student issues or concerns is also provided. Please provide your comments! Comments as also encouraged via email messages to the instructor.

Email Account Requirement

Students are required to obtain an email account. If you do not already have an email account we encourage you to obtain one via one of the many free email services on the World Wide Web such as Hotmail.com or Yahoo.com. Using a Web client such as Netscape Navigator or Microsoft Explore visit the email site and sign up for an email account. It is also possible to obtain an email account from the University via BroncoMail found on the WMU Home Page (http://www.wmich.edu). Instructors in ED347 will NOT provide temporary class emails!

Ed347 Blackboard.com Course Sites

Students are required to enroll in their ED347 Blackboard.com site for course communications, grading information, and access to other course related resources. Enroll at the http://coursesites.blackboard.com web page using the "student enrollment" section. There are several ED347 web sites on Blackboard. Make sure you enroll in the correct section!

Taskstream Accounts (Taskstream.com)

Students are required to get an account with the http://taskstream.com Lesson Planning site. Information will be provided to students in class for subscribing to this service.
Academic Integrity

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 271-272) [Graduate (pp. 24-26)] Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Judicial Affairs. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.
ED 347 - Winter 2002
Technology for Elementary Education

Course Description (WMU Undergraduate Catalog 1999-2001):

An introduction to the contributions of instructional technology to learning and teaching in elementary education. The course will provide a survey of critical use of technology appropriate (for meeting or exceeding the ISTE National Educational Technology Standards for Teachers.) This will enable students to acquire basic skills in producing and using computers, video and other instructional technologies in educational applications. Concurrent enrollment with ED 351 is encouraged.

Monday (Call #37325) and Wednesday (Call #29732) Sections
Lectures - Monday - 2304 Sangren Hall (See Schedule)
Lectures - Wednesday - 2304 Sangren Hall (See Schedule)
Computer Labs - 2202, 3204, and 3206 Sangren Hall

(See Lab Schedules in Winter Course Catalog)

Instructors: (This course is team taught by six individuals)

Alfredo Aleman, Kalamazoo Public Schools
Nancy Beukema, PT3 Project
Bob Leneway, PT3 Project
Mary Jane Mielke, PT3 Project
Howard Poole, Ed Tech Program and PT3 Project
Craig Thomas, Ed347 Graduate Assistant

Monday Section Instructor of Record -

Alfredo Aleman
Kalamazoo Public Schools
616-387-6050
alfredo.aleman@wmich.edu

Wednesday Section - Instructor of Record -

Howard Poole
Educational Technology Program
Course Office - 3419 Sangren Hall (Office of Dr. Poole)
Course Office Hours - 10:00 AM to 3:00 PM Monday and Wednesday or by Appointment
Course Web Site - http://www.wmich.edu/pt3/
Course Email - maryjane.mielke@wmich.edu

Required Items:
1. Email Address
2. Registration on http://coursesites.blackboard.com (free)
3. Registration on http://taskstream.com ($20.00)
4. Registration on http://profiler.pt3.org
5. Registration on http://thinkquest.org
6. Access to a computer with an updated Internet Browser (i.e., Version 4.0 or higher of Netscape or 4.0 of Microsoft Explorer)
7. Adequate hard drive space and/or multiple diskettes for backups of all of your assignments.
8. Five or more high density 3.5 inch computer diskettes (IBM formatted)
9. No TEXTBOOK is required!

ED 347 Instructor Biographical Information:

Alfredo Aleman - Alfredo is currently teaching in the Kalamazoo Public Schools at the elementary level. He has considerable experience teaching with the use of technology and has directed teams of teachers as they explored the integration of technology into the Kalamazoo Elementary Level curriculum. He is the instructor of record for the Monday section of ED347. (Email = alfredo.aleman@wmich.edu)

Nancy Beukema - Nancy has just retired after more than twenty years of teaching special education. She has also just completed her doctorate degree in Special Education Technology and regularly teaches the special education technology course (SPED537). She is currently teaching several courses for Western and working for the PT3 project. (Email = nancy.beukema@wmich.edu)

Robert Leneway - Bob is currently directing the Preparing Tomorrow's Teachers to Use Technology (PT3) Project as well as several other projects as part of the Tate Center in the College of Education. The federally funded PT3 Project is a three year project designed to enhance the educational technology skills of all undergraduates in the College of Education. Bob will assist ED347 instructors with several elements of the course and will be responsible
for gathering information about the technology skills of ED347 students. (Email = bob.leneway@wmich.edu)

Mary Jane Mielke - Mary Jane has recently joined the Preparing Tomorrow's Teachers to Use Technology (PT3) Project as technology resource person to assist student teachers and mentor teachers with the use of technology in WMU Cluster Site schools as part of the SUPT Collaborative. It is likely that Mary Jane will be available to help ED347 students with using technology when they are student teaching in future semesters. Mary Jane has an extensive history of working with vocational student teachers and has recently moved to the Kalamazoo area from Ohio. (Email = maryjane.mielke@wmich.edu)

Howard Poole - Howard is program director for the Educational Technology Program in the Department of Educational Studies at Western. He regularly teaches technology classes at the graduate and undergraduate level. He is also working part time this year with the PT3 Project. (Email = howard.poole@wmich.edu)

Craig Thomas - Craig has taught classes at Western for several years and is serving as the graduate assistant in Ed347 this semester. He also has extensive experience in using technology for a variety of purposes and currently works operates as a web master for several groups. (Email = craig.thomas@wmich.edu)

Course Goal/Competencies:

The general goal of ED347 is to familiarize undergraduate students studying elementary education with the technologies that are used in many of today's elementary education classrooms. The course will introduce students to several basic computer applications and require that each student demonstrate their competency in using the applications as part of class communications and as part of class assignments. The major components of the class include creating lesson plans that integrate technology into academic subjects using Michigan Academic Benchmark Standards and ISTE Technology Standards for Teachers. These assignments will require use of the Taskstream online lesson planning tool. Another major component of the class is creating a web-based portfolio that will include a home page, resume page, personal page, technology competency page, and a major/minor page. The final component of the course is the development of a collaborative ThinkQuest professional development or K-8 subject area web site for integrating technology into elementary education. Students will work in teams to complete this last assignment.

Course Competencies (Based on ISTE 2000 Technology Standards)

Competency I - Using Email - Students will be required to obtain an email account for use during the course as part of course communication activities. The email address is needed for communications with the ED347 Web-site on http://coursesites.blackboard.com Students will be required to obtain their own email account through free email services on the World Wide Web such as Hotmail.com or Yahoo.com or through a temporary email account with Western Michigan University.
Competency II - Using a Web-based Course Management System - Students will be required to enroll in the ED347 course management system provided by Blackboard. Students will need to gain a working knowledge of the course management options within the Blackboard system for communications via discussion boards and email. Evaluations scores (points) for assignments will be posted on Blackboard. Regular announcements about the course activities and changes will be posted on the ED347 Blackboard site.

Competency III - Using the Internet - Students will be expected to use the Internet on a weekly basis for course related discussion, communications, materials, and resources. Using the Internet will require a working knowledge of a web client such as Netscape Navigator or Microsoft Explorer. These software tools can be found in all WMU computer labs on campus or can be downloaded free from Netscape or Microsoft. Students will be required to evaluate an educational web site as well as prepare items for placement on the Web as part of creating a personal web-base portfolio and as part of a ThinkQuest web site development project.

Competency IV - Creating Desktop Presentations - Students will be required to create a Microsoft PowerPoint presentation. The presentation will demonstrate a working knowledge of the PowerPoint software, the use of graphics, and the ability to print a paper copy of the PowerPoint slides.

Competency V - Creating a Spreadsheet - Students will be expected to create a simple data collection page on a Microsoft Excel spreadsheet. The assignment will require a working knowledge on introductory spreadsheet formatting and printing commands.

Competency VI - Web Page Authoring - Students will be required to create several web pages and a web site using various web authoring tools including creating a personal portfolio site and a collaborative site on Thinkquest.

Competency VII - Desktop Publishing - Students will be required to use a common desktop publishing authoring software to create newsletter that can be used by elementary teachers.

Competency VIII - Use of the Inspiration Planning Tools - Students will be required to use the Inspiration Software tool to plan a comprehensive lesson. Inspiration software (www.inspiration.com) is a visual learning tool used to assist with the development of ideas and to organize thinking by individuals and small groups.

Competency IX - Integration of Technology into Lesson Plans - Students will be required to use the TaskStream Curriculum Builder Lesson Planning tool to create three lessons that integrate Michigan Academic Benchmark Standards and ISTE Technology Standards. The lesson planning assignments also require the creation of scoring rubrics using the Taskstream Rubric Wizard.

Competency X - ThinkQuest Web Site Development - Students will be expected to work in teams to create a professional development or K-8 subject area site that could integrates Internet technology into the classroom. The ThinkQuest model uses a collaborative learning model that includes participants from the ED347 course as well as others outside the class. The common product of the ThinkQuest model is an online of web resource site for teachers and other lesson planning idea for their students.

Competency XI - Hands-on Experience Using Instructional Technology Equipment - Students will be expected to demonstrate skill and confidence in using technology related equipment common found in elementary education classrooms including computers, video projection equipment, video conferencing equipment, and other forms of digital electronics.
Final Schedule ED347 Winter 2002 (last revised 1-7-2002)

Week 1 - January 7/9 - Introduction to Course and Assignment I - Course Website, Blackboard, Taskstream, and Profiler - Digital Divide Paper
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Digital Divide Paper Due 12:00 midnight Friday, January 18th
- Profiler Pre-course Survey Due by 12:00 midnight, Friday, January 18th

Week 2 - January 14 /16 - Assignment II - Introduction to Computer Operations/Terminology (multiple lab activities)
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Computer Operations Quiz Due 12:00 midnight Friday, January 25th

Week 3 - January 21/23 Assignment III - Powerpoint presentation using digital cameras, scanners, and other multimedia items
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Powerpoint Assignment Due 12:00 midnight Friday, February 1st

Week 4 - January 28/30 - Introduce Assignment IV - Integrated Lesson Plan A with Taskstream, Hot List, Web Site Evaluations, and Library/Media Technology Support
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Integrated Lesson Plan A Due midnight Friday, February 8th

Week 5 - February 4/6 - Introduction to Assignment V - Student Portfolio, Introduction to Dreamweaver
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Student Portfolio Assignment Part One Due midnight Friday, March 1
- Student Portfolio Assignment Part Two Due midnight Friday, March 15

Week 6 - February 11/13 - Introduction to Homepages and work on FTP and Dreamweaver Operation for Student Portfolio (lab)
NO LECTURE THIS WEEK!! - Labs 3:30-5:00 pm and 6:30-8:00 pm

Week 7 - February 18/20 - Introduction to Assignment VI - Assistive Technology (lecture)
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Assistive Technology Quiz Due midnight Friday, March 1
Week 8 - February 25/27 - Introduction to Assignment VII - Thinkquest Team Project -
Intro to Inspiration
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Thinkquest Team Project Part A Due week of March 18 - 22
- Thinkquest Team Project Part B Due week of April 22-26th

Spring Break Week - March 4 - 8 - NO CLASS

Week 9 - March 11/13 - Introduce Assignment VIII - Integrated Lesson Plan B with Excel
Data Collection
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Integrated Lesson Plan B Due midnight Friday, March 29

Week 10 - March 18/20 - Work on Lesson Plan and/or Thinkquest Project - Team
Proposal Approved
NO LECTURE THIS WEEK!! - Labs 3:30-5:00 pm and 6:30-8:00 pm

Week 11 - March 25 /27 - Assignment IX - Integrated Lesson Plan C with WebQuest,
Virtual Fieldtrip, or Distance Learning Application (two-way video demo)
Lecture 5:30-6:20 pm - Labs 3:30-5:00 pm and 6:30-8:00 pm

- Integrated Lesson Plan C Due midnight Friday, April 12

Week 12 - April 1/3 - Work on Lesson Plan and/or Thinkquest Project
NO LECTURE THIS WEEK!! - Labs 3:30-5:00 pm and 6:30-8:00 pm

Week 13 - April 8/10 - Assignment X - Using Microsoft Publisher for Classroom Projects
and Newsletters
Lecture 5:30-6:20 pm- Labs 3:30-5:00 pm and 6:30-8:00 pm

- Microsoft Publisher Assignment Due midnight Friday, April 19

Week 14 - April 15/17 - Work on Lesson Plan and/or Thinkquest Project
NO LECTURE THIS WEEK!! - Labs 3:30-5:00 pm and 6:30-8:00 pm

Week 15 (Finals) April 22-26 - Schedule Team Presentations during Final week - 30
minute presentations

- Profiler Post-course Survey Due midnight Friday, April 16
- Online Course Evaluation Due midnight Friday, April 26

Top of Page, Instructors, Course Goals, Course Schedule, Assignments, Grades,
Related Items
Summary of Assignments

Profiler Pre-Course Survey - (Due January 18th)

Assignment I - Digital Divide Paper (Due January 18th)

Assignment II - Computer Operations/Terminology Quiz (Due January 25th)

Assignment III - PowerPoint Presentation (Due February 1st)

Assignment IV - Integrated Lesson Plan A (Due February 8th)

Assignment V - Student Portfolio Assignment Part One (Due March 1st)

Assignment VI - Assistive Technology Quiz (Due March 1st)

Assignment V - Student Portfolio Part Two (Final WebSite) - Due March 15th

Assignment VII - Thinkquest Proposal Part A (Due Week of March 18-22)

Assignment VIII - Integrated Lesson Plan B (Due March 29th)

Assignment IX - Integrated Lesson Plan C (Due April 12th)

Assignment X - Microsoft Publisher Assignment (Due April 19th)

Assignment VII - Thinkquest Project Part B (Due Week of April 22-26th)

Profiler Post Course Survey (Due April 26th)

Online Course Evaluation (Due April 26th)

Summary of Assignment Points

Pre-course Profiler Survey - 10 Points

Assignment I - Blackboard, Taskstream, Digital Divide Paper - 50 Points

Assignment II - Computer Operations/Terminology - 50 Points

Assignment III - PowerPoint Presentation - 50 Points

Assignment IV - Integrated Lesson Plan A - 50 Points

Assignment V - Student Portfolio Part One - 75 Points

Assignment V - Student Portfolio Part Two - 75 Points
Assignment VI - Assistive Technology Quiz - 50 Points
Assignment VII - Thinkquest Project Part A - 75 points
Assignment VII - Thinkquest Part B - 75 points
Assignment VIII - Integrated Lesson Plan B - 50 Points
Assignment IX - Integrated Lesson Plan C - 50 Points
Assignment X - Microsoft Publisher - 50 Points
Post-course Profiler - 10 Points

- Total Assignment Points = 700 Points
- Pre and Post Profiler Survey Points = 20 Points
  - Extra credit - Lab Attendance
    (14 weeks @ 3 points week) = 42 Points

Summary of ED 347 Points Needed for Grades for Fall 2001

ED 347 Grading Scale

A - 93% - 100% - 670-720 Points
BA - 88% - 92% - 633-669 Points
B - 83% - 87% - 598 - 632 Points
CB - 78% - 82% - 562-597 Points
C - 73% - 77% - 526-561 Points
DC - 68% - 72% - 490-525 Points
D - 63% - 67% - 454-489 Points
E - Below 63% - 453 Points or lower

Other ED347 Related Course Items
Assignment Details

The format of the assignment will be described in detail in each assignment description. Due dates for assignments are on Fridays. Assignments should be submitted before 12:00 midnight on those days via electronic means. Late assignments will lose 20 points for each week they are late. Your name, ED347 section, and the Assignment Name should be included on each assignment. Points awarded for assignments will be posted as soon as possible on the ED347 coursesites.blackboard.com grading system by the ED347 Course Instructors. Questions about grades and assignments should be emailed to Mary Jane Mielke (http://coursesites.blackboard.com web page using the "student enrollment" section. There are several ED347 web sites on Blackboard. Make sure you enroll in the correct section!

Taskstream Accounts (Taskstream.com)

Students are required to get an account with the http://taskstream.com Lesson Planning site. Information will be provided to students in class for subscribing to this service. The service will cost the student $20 per semester and can be paid for with a credit card at the time of registration. Students should contact Taskstream directly at their 800 number for specific questions.

Academic Integrity

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 271-272) [Graduate (pp. 24-26)] Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Judicial Affairs. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.
EDT 347 - Fall 2002
Technology for Elementary Education (revised 8-28-2002)

Course Description (WMU Undergraduate Catalog 1999-2001):

An introduction to the contributions of instructional technology to learning and teaching in elementary education. The course will provide a survey of critical use of technology appropriate (for meeting or exceeding the ISTE National Educational Technology Standards for Teachers.) This will enable students to acquire basic skills in producing and using computers, video and other instructional technologies in educational applications. Concurrent enrollment with ED 351 is encouraged.

Monday (Call #68124) and Wednesday (Call #68186) Sections
Lectures - Monday - 2302 Sangren Hall (See Schedule)
Lectures - Wednesday - 2302 Sangren Hall (See Schedule)
Computer Labs - 2202, 3204, and 3206 Sangren Hall
Open Computer Lab - Friday, 1-4 pm, 2202 Sangren Hall
Course Office - 3419 Sangren Hall (Office of Dr. Poole)
Course Office Hours - 10:00 AM to 3:00 PM Monday and Wednesday or by Appointment
Course Web Site - http://www.wmich.edu/pt3/
Course Email - maryjane.mielke@wmich.edu

(See Lab Schedules in Fall Course Catalog)

Instructors: (This course is team taught by seven individuals)

Bob Leneway, PT3 Project
Mary Jane Mielke, PT3 Project
Ken Werner, Ed Tech Program
Anne Ottenbriet, EDT347 Graduate Assistant
Howard Poole, Ed Tech Program and PT3
Craig Kami, Department of Distance Education
Julie Cottin, Department of Distance Education

Monday Section Instructor of Record -

Howard Poole
Wednesday Section - Instructor of Record -

Ken Werner
Educational Technology Program
Department of Educational Studies, WMU
Office - 3507 Sangren Hall
616-387-6050, Fax - 616-387-5703
http://mailto:kwerner@wmich.edu/

Online Section - Instructor of Record -

Craig Kami
Department of Distance Education
Extended University Programs
Office - Ellsworth Hall
616-387-4198
http://mailto:craig.kami@wmich.edu/

Required Items:

1. - Working Email Service
2. - Unified Computer Account with Western (needed for WebCT and Homepages) (free)
3. - Registration on http://webct.wmich.edu/ (free)
4. - Registration on http://taskstream.com/ ($20.00 Fee Required)
5. - Registration on http://profiler.pt3.org/ (free)
6. - Registration on http://thinkquest.org/ (free)
7. - Registration on http://www.editu.org/ (Smartforce - free)
8. - Access to a computer with Internet access and an updated Internet Browser (ie. Version 4.0 or higher of Netscape or 4.0 of Microsoft Explorer
9. - Adequate hard drive space and/or multiple diskettes for backups of all of your assignments.
10. - Five or more high density 3.5 inch computer diskettes (IBM formatted) or 100 megabyte Zipdisk
11. - No TEXTBOOK is required!

EDT 347 Instructor Biographical Information:

Top of Page, Instructors, Course Goals/Competencies, Course Schedule, Lecture Summary, Assignments, Assignment Points, Grading Scale, Related Items
Robert Leneway - Bob is currently directing the Preparing Tomorrow's Teachers to Use Technology (PT3) Project as well as several other projects as part of the Tate Center in the College of Education. The federally funded PT3 Project is a three year project designed to enhance the educational technology skills of all undergraduates in the College of Education. Bob will assist EDT347 instructors with several elements of the course and will be responsible for gathering information about the technology skills of EDT347 students. (Email: bob.leneway@wmich.edu)

Mary Jane Mielke - Mary Jane is a member of the Preparing Tomorrow's Teachers to Use Technology (PT3) Project. She is a technology resource person to assist student teachers and mentor teachers with the use of technology at the WMU Cluster Site schools. Mary Jane will be available to help EDT347 students with using technology while they are student teaching in future semesters. Mary Jane has an extensive history of working with vocational student teachers and has recently moved to the Kalamazoo area from Ohio. (Email = maryjane.mielke@wmich.edu)

Howard Poole - Howard is program director for the Educational Technology Program in the Department of Educational Studies at Western. He regularly teaches technology classes at the graduate and undergraduate level. He is also working part time this year with the PT3 Project. (Email = howard.poole@wmich.edu)

Anne Ottenbreit - Anne is a recent Elementary Education graduate currently working on her masters degree in the Educational Technology Program. She is a recent winner of the Pre-service MCOATT award. (Email = anne.ottenbreit@wmich.edu)

Kenneth Werner - Ken is a recent doctoral graduate of the Counseling and Counselor Psychology Program. Last year he assisted the Office of Teaching and Learning as a learning systems specialist. He has worked to develop and implement a variety of collaborative learning projects, even producing a collaborative learning video for use in faculty classroom instruction. He has authored web based articles on a variety of topics. (Email = kwerner@wmich.edu)

Craig Kaml - Craig was recently appointed Director of the Office of Distance Education for the University Extended Programs Division. He was previously at Eastern Carolina University where he developed and ran online learning programs and taught in the Educational Technology Program. Craig will be handling the new online version of this course. (Email = craig.kaml@wmich.edu)

Julie Cottin - Julie is a course designer in the Department of Distance Education and a graduate student in the Ed Technology Program. She helps faculty design and develop online classes for Western and is the lead EDT347 instructor on the use of WebCT for this semester. She will also assist with the online version of EDT347. (Email = julie.cottin@wmich.edu)
Course Goal/Competencies:

The general goal of EDT 347 is to familiarize undergraduate students studying elementary education with the technologies that are used in many of today's elementary education classrooms. The course will introduce students to several basic computer applications and require that each student demonstrate their competency in using the application as part of class communications and as part of class assignments. The major components of the class include creating lesson plans that integrate technology into academic subjects using Michigan Academic Benchmark Standards and ISTE Technology Standards for Teachers. These assignments will require use of the Taskstream online lesson planning tool. Another major component of the class is creating a web-based teaching portfolio that will include a home page, resume page, personal page, technology competency page, and a major/minor page. Another component of the course is the development of a collaborative ThinkQuest professional development or area web site for integrating technology into elementary education. Students will work in teams to complete this last assignment.

Course Competencies (Based on ISTE 2000 Technology Standards)

Competency I - Using Email - Students will be required to obtain an email account for use during the course as part of course communication activities. The email address is needed for communications with the EDT347 Web-site on http://webct.wmich.edu/ Students will be required to obtain their own email account through the University Unified Computer Accounts. Students can also redirect their University email to free email services on the World Wide Web such as Hotmail.com or Yahoo.com or through a commerical account from AOL.com or other Internet service providers.

Competency II - Using a Web-based Course Management System - Students will be required to enroll in the EDT347 course management system provided by WebCT. Students will need to gain a working knowledge of the course management options within the WebCT system for communications via discussion boards and email. Evaluation scores (points) for assignments will be posted by instructors on WebCT. Regular announcements about course activities and changes will be posted on the EDT347 WebCT site.

Competency III - Using the Internet - Students will be expected to use the Internet on a weekly basis for course related discussion, communications, materials, and resources. Using the Internet will require a working knowledge of a web client such as Netscape Navigator or Microsoft Explorer. These software tools can be found in all WMU computer labs on campus or can be downloaded free from Netscape or Microsoft. Students will be required to evaluate an educational web site as well as prepare items for placement on the Web as part of creating a personal web-base portfolio and as part of a ThinkQuest web site development project.

Competency IV - Creating Desktop Presentations - Students will be required to create a Microsoft PowerPoint presentation. The presentation will demonstrate a working knowledge of the PowerPoint software and the use of multimedia graphics. Students will be expected to use a digital camera to take a photo and to scan in images using a scanner as needed. Students are also encouraged to make use of Powerpoint clip art, images and graphics from the Internet, and sound and animation options from Powerpoint.

Competency V - Creating a Spreadsheet - Students will be expected to create a simple data collection spreadsheet on Microsoft Excel. The assignment will require a working knowledge
on introductory spreadsheet formatting and printing commands, use of formulas for spreadsheet calculations, and the creation of a spreadsheet chart.

**Competency VI - Web Page Authoring** - Students will be required to create several web pages and a web site using the Dreamweaver web authoring tool including creating a multi-page teaching portfolio on the University Homepages Server and a collaborative teaching resource site on the Thinkquest server. Students will be expected to demonstrate their web pages development skills in a mid-term exam.

**Competency VII - Desktop Publishing** - Students will be required to use a common desktop publishing authoring software, Microsoft Publisher to create an example newsletter that can be used by elementary teachers.

**Competency VIII - Use of the Inspiration Graphic Planning Tool** - Students will be required to use the Inspiration software tool as part of a comprehensive lesson. Inspiration software (www.inspiration.com) is a visual learning tool used to assist with the development of ideas and to organize thinking by individuals and small groups.

**Competency IX - Integration of Technology into Lesson Plans** - Students will be required to use the TaskStream Curriculum Builder Lesson Planning tool to create two lessons that integrate Michigan Academic Benchmark Standards and ISTE Technology Standards. The lesson planning assignments also require the creation of scoring rubrics using the Taskstream Rubric Wizard.

**Competency X - ThinkQuest Web Site Development** - Students will be expected to work in teams to create a professional development web site that integrates Internet technology into the classroom. The ThinkQuest model uses a collaborative learning model that includes participants from the EDT347 course as well as others outside the class. The common product of the ThinkQuest model is an online web resource site for teachers includes resource materials, Internet resources, class teaching activities, and lesson plan ideas, or examples, for their students. Each Thinkquest website must include original material developed by the student team as well as reflective items on how the site could be used by other teachers.

**Competency XI - Hands-on Experience Using Instructional Technology Equipment** - Students will be expected to demonstrate skill and confidence in using technology related equipment commonly found in elementary education classrooms including desktop computers, laptop computers, wireless computers, video projection equipment, digital cameras, scanners, video conferencing equipment and other forms of digital electronics.

**Competency XII - Independent Learning Experience Using the SmartForce Training Systems** - Students will be expected to demonstrate skill and confidence in using the SmartForce training systems commonly available for elementary teachers. These online learning systems are valuable resources for learning about new applications and teaching resources. Students will be expected to complete training programs on basic computer operations, use of Excel, use of Dreamweaver, and use of Fireworks.
Schedule EDT347 Fall 2002

(No Classes Monday - Sept 2nd - Holiday) Week 1 - September 3-6 - Introduction to Course and Assignment I - Instructional PowerPoint Presentation
- Also Sign up for University Unified Account, WebCT Account, Taskstream, SmartForce, and Profiler
- Also Independent Study Option Explained (EDT347 Online Course)

Lecture 5:30-6:20 pm - 2302 Sangren Hall (Wednesday only) Topic: Intro to Course
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
- Instructional PowerPoint Lesson Due 12:00 midnight Friday, Sept. 20th
- Profiler Pre-course Survey Due by 12:00 midnight, Friday, Sept. 20th

Week 2 - September 9-13 - Introduction to Course and Assignment I - Instructional PowerPoint Presentation
- Also Sign up for University Unified Account, WebCT Account, Taskstream, SmartForce, and Profiler
- Also Independent Study Option Explained

Lecture 5:30-6:20 pm - 2302 Sangren Hall (Monday Only) Topic: Intro to Course
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall
- Instructional PowerPoint Lesson Due 12:00 midnight Friday, Sept. 20th
- Profiler Pre-course Survey Due by 12:00 midnight, Friday, Sept. 20th

Week 3 - September 16-20 Assignment II - Introduction to Computer Operations/Terminology
- Also Smart Force Training Modules and Multiple Lab Activities

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Basic Computer Operations
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall
- Smart Force Training Modules due Friday, September 27th

Week 4 - September 23-27 - Introduce Assignment III - Integrated Lesson Plan A with Taskstream, Hot List, Web Site Evaluations, and Library/Media Center Technology Support

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Role of Media Specialists
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

Integrated Lesson Plan A Due midnight Friday, October 4th

Library/Media Center Technology Quiz Due midnight Friday, October 4th

Week 5 - Sept 30 - October 4 - Introduction to Assignment IV - Teaching Portfolio
- Also Introduction to Dreamweaver Training Tutorials (Due Sunday, September 29th)

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Teaching Portfolios and Future Employment Opportunities
Labs 8:30-10:00 am, 1:30-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Complete Smartforce Dreamweaver training module (Before class - Due midnight, Sunday, Sept 29th)
- Teaching Portfolio Assignment IV - Part One Due midnight Friday, Oct 11
- Student Portfolio Assignment IV - Part Two Due midnight Friday, October 18

Week 6 - October 7-11 - Introduction to Homepages and Dreamweaver Operation for Teaching Portfolio (lab only)

NO LECTURE THIS WEEK!!
Labs 8:30-10:00 am, 1:30-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Teaching Portfolio Assignment IV - Part One Due midnight Friday, Oct 11

Week 7 - October 14-18 - Introduction to Assignment V - Assistive Technology (lecture)
- Also last week to complete Teaching Portfolio

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Assistive Technology
Labs 8:30-10:00 am, 1:30-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Student Portfolio Assignment IV - Part Two Due midnight Friday, October 18
- Assistive Technology Case Study Due midnight Friday, October 25

Week 8 - October 21-25 - Mid-term Lab Exam - Creating Webpages

NO LECTURE THIS WEEK!!
Labs 8:30-10:00 am, 1:30-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Assistive Technology Case Study Due midnight Friday, October 25
Week 9 - October 28-November 1  - Assignment VI - Intro to Integrated Lesson Plan B - Data Collection and Analysis
- Also Training Module for Excell Spreadsheet

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Using Computer Labs
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Taskforce Training Module on Excel Due Midnight Sunday, October 27th
- Using Computer Labs Quiz - Due Nov 8th - 25 points
- Integrated Lesson Plan B Due midnight Friday, Nov 15

Week 10 - November 4-8 - Introduction to Assignment VII - Thinkquest Team Project - Intro to Inspiration

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Virtual Field Trips - Teleconferencing
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Virtual Field Trips and Teleconferencing Quiz - Due Nov 15th - 25 points
- Thinkquest Team Project Part A Due week of Nov 15th
- Thinkquest Team Project Part B -Team Presentation - Due week of December 9-12

Week 11 - November 11-15 - Assignment VIII - Using Microsoft Publisher for Classroom Projects and Newsletters

Lecture 5:30-6:20 pm - 2302 Sangren Hall - Topic: Handheld Computers (Palm Computers)
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)
EDT347 Open Lab Time - Friday Only - 1:00 -4:00 pm - 2202 Sangren Hall

- Virtual Field Trips and Teleconferencing Quiz - Due Nov 15th - 25 points
- Handheld Computer Quiz - Due Nov 23rd - 25 points
- Microsoft Publisher Assignment Due midnight Friday, November 23

Week 12 - November 18-23 - Work on Publisher Assignment and/or Thinkquest Project - Team Proposal Approved

NO LECTURE THIS WEEK!!
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)

- Handheld Computer Quiz - Due Nov 23rd - 25 points
- Microsoft Publisher Assignment Due midnight Friday, November 23rd

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Week 13 - November 25-29 - NO CLASS - Thanksgiving Break

Week 14 - December 2-6 - Work on Newsletter and/or Thinkquest Project

NO LECTURE THIS WEEK!!
Labs 8:30-10:00 am, 1-3:30 pm, 3:30-5:00 pm and 6:30-8:00 pm
(Various rooms - 2202, 3204, and 3206 Sangren Hall)

Week 15 - (Finals) December 9-12 - Schedule Team Presentations during Final week - 30 minute presentations for each Team

NO LECTURES or LABS THIS WEEK!!!!

- Thinkquest Team Project Part B - Team Presentation - Due week of December 9-12
- Profiler Post-course Survey Due midnight Friday, December 12th
- Online Course Evaluation Due midnight Friday, December 12th

EDT347 Assignment Summary

- Pre-Course Profiler - Due September 20th - 20 points
- Assignment I - Instructional PowerPoint Presentation - Due Sept 20th - 100 points
- Assignment II - Computer Operations
  - Smartforce Computer Operations Training Modules - Due Sept 27th - 75 points
- Assignment III - Integrated Lesson Plan A (Using the Internet for Teaching)
  - Lesson Plan A Completed - Due October 4th - 100 points
  - Library/Media Center Quiz - Due October 4th - 25 points
- Assignment IV - Teaching Portfolio
  - Smartforce Dreamweaver Training Module - Due Sept 29th - 25 points
  - Draft Pages Located on Homepages Server - Due October 11th - 75 points
  - Final Pages Completed - Due October 18th - 75 points
  - Mid-term Exam Using Dreamweaver to Create Web Sites - Week Oct 21-25 - 200 points
- Assignment V - Assistive Technology Case Study - Due October 25th - 25 points
- Assignment VI - Integrated Lesson Plan B (Using Excel to Collect Data)
  - Smartforce Training Modules on Excel - Due October 27th - 25 points
  - Lesson Plan B Completed - Due Nov 15th - 100 points
  - Using Computer Labs Quiz - Due Nov 8th - 25 points
- Assignment VII - Thinkquest Team Project
  - Virtual Field Trips and Teleconferencing Quiz - Due Nov 15th - 25 points
  - Develop Proposal and Complete Team Organization - Due Nov 15th - 50 points
  - Final Team Presentations - Due Week of December 9-12, 150 points
- Assignment VIII - Microsoft Publisher Newsletter - Due November 23th - 100 points
- Handheld Computers Quiz - Due November 23th - 25 points
- Post Course Profiler - Due December 16th - 20 points
EDT 347 Lecture Summary

• Lecture One (September 4th and Sept 9th) - 3 extra credit points
  Introduction to EDT347 Course
  ▪ Digital Nature of Course
  ▪ Course Instructors
  ▪ Course Schedule
  ▪ Course Design (lectures, independent study, labs, assignments)
  ▪ Grading Information
  ▪ Brief Introduction to Assignment I - Instructional PowerPoint
  ▪ Overview of Course Internet Tools (WebCT, Taskstream, Smartforce, Profiler)
  ▪ Other Questions/Comments

• Lecture Two (September 16th and 18th) - 3 extra credit points
  Computer Operations/Terminology
  ▪ Overview of Smart Force Tutorials
  ▪ Review of PC Computers and Related Equipment
  ▪ Review of Operating Systems
  ▪ Review of Networks
  ▪ Other Questions/Comments

• Lecture Three (September 23rd and 25th) - 3 extra credit points
  Library/Media Center Center Technology Support
  ▪ Roles of Media Specialists/Librarians
  ▪ Examples of Technology Support Services
  ▪ Demonstration of MEL (Michigan eLibrary)
  ▪ Review of Media Specialist/Librarian Quiz Process
  ▪ Other Questions/Comments

• Lecture Four (September 30th and October 1st) - 3 extra credit points
  Teaching Portfolio and Future Employment Opportunities
  ▪ Introduction to Digital Portfolios
  ▪ Introduction to EDT 347 Portfolios
  ▪ Job Resumes - University Placement Services
  ▪ MCOATT Awards and Winners
  ▪ Other Questions/Comments

• Lecture Five (October 14th and 16th) - 3 extra credit points
  Assistive Technology
  ▪ Special Education Students and Inclusion
  ▪ Specialized Keyboards and Mice
  ▪ Sound and Speech Devices
  ▪ Software and Operating Systems
  ▪ Specialized Computers
  ▪ Overview of Case Study Assignment Process
  ▪ Other Questions/Comments
• Lecture Six (Oct 28th and 30th) - 3 extra credit points
  Using Computer and Computer Labs in Elementary Teaching
  ■ Use of Computers in the Classroom
  ■ Use of Computer Labs in Elementary Classes
  ■ People Who Manage Computer Labs
  ■ Teacher Websites - Web Resources
  ■ Overview of Computer Lab Quiz Process
  ■ Other Questions/Comments

• Lecture Seven (Nov 4th and 6th) - 3 extra credit points
  Virtual Field Field Trips - Teleconferencing
  ■ Introduction to Virtual Field Trips and Teleconferencing
  ■ Web Resources for Teleconferencing in Michigan
  ■ Interaction with Teleconferencing-Virtual Field Trip Site
  ■ Overview of Virtual Trip/Teleconferencing Quiz Process
  ■ Other Questions/Comments

• Lecture Eight (Nov 11th and 13th) - 3 extra credit points
  Handheld Computers (Palm Computers)
  ■ What are Handheld Computers?
  ■ Demonstration of Operation of Handheld Computers
  ■ Educational Applications with Handheld Computers
  ■ Overview of Handheld Computer Quiz Process
  ■ Other Questions/Comments

Summary of Assignment Points

Pre-course Profiler Survey - 20 Points
Assignment I - Instructional Powerpoint Example - 100 Points
Assignment II - Computer Operations/Terminology - 75 Points
Assignment III - Integrated Lesson Plan A - 100 Points
Assignment III - Library/Media Center Quiz - 25 Points
Assignment IV - Dreamweaver Training Module - 25 Points
Assignment IV - Teaching Portfolio Draft Pages - 75 Points
Assignment IV - Teaching Portfolio Final Pages - 75 Points
Web Pages/Site Mid Term - 200 Points
Assignment V - Assistive Technology Case Study - 25 Points
Assignment VI - Excel Training Module - 25 Points
Assignment VI - Integrated Lesson Plan B - 100 Points
Assignment VI - Using Computer Labs Quiz - 25 Points
Assignment VII - Virtual Field Trips/Teleconference Quiz - 25 Points
Assignment VII - Thinkquest Project Proposal - 50 Points
Assignment VII - Thinkquest Final Project - 150 Points
Assignment VIII - Microsoft Publisher Newsletter - 100 Points
Assignment VIII - Handheld Computer Quiz - 25 Points
Post-course Profiler - 20 Points
**Extra Credit Lecture Points - 8 lectures x 3 points = 24 Points
**Extra Credit Lab Points - 12 labs x 3 points = 36 Points

- Total Assignment Points = 1240 Points plus 60 Extra Credit Points
  ** Extra Credit for the Online students will be awarded for getting assignments completed and submitted to instructors on time.

Summary of EDT 347 Points Needed for Grades for Fall 2002

EDT 347 Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>93% - 100%</td>
<td>1153 or Higher</td>
</tr>
<tr>
<td>BA</td>
<td>88% - 92%</td>
<td>1091-1152 Points</td>
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<tr>
<td>B</td>
<td>83% - 87%</td>
<td>1090 Points</td>
</tr>
<tr>
<td>CB</td>
<td>78% - 82%</td>
<td>967-1028 Points</td>
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<tr>
<td>C</td>
<td>73% - 77%</td>
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<td>DC</td>
<td>68% - 72%</td>
<td>843-904 Points</td>
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<td>D</td>
<td>63% - 67%</td>
<td>781-842 Points</td>
</tr>
<tr>
<td>E</td>
<td>Below 63%</td>
<td>780 or Lower Points</td>
</tr>
</tbody>
</table>

Assignment Details

The format of the assignment will be described in detail in each assignment description. Due dates for assignments are on Fridays. Assignments should be submitted before 12:00 midnight on those days via electronic means. Late assignments will lose 20 points for each week they are late. Your name, EDT 347 section, and the Assignment Name should be included on each assignment. Points awarded for assignments will be posted as soon as possible on the EDT 347 WebCT grading system by the EDT 347 Course Instructors. Questions about grades and assignments should be emailed to your lab instructor and/or Mary Jane Mielke (mailto:maryjane.mielke@wmich.edu/)
EDT 347 Computer Lab Schedule

A key component of this course is the use of computer labs to complete assignments and to provide students with the tools and an opportunity to practice the skills needed to complete the assignments. Students will be expected to spend an hour or more each week using a computer. Students are encouraged to attended lab times as scheduled during course registration. Lab times are available for Monday and Wednesdays in Rooms 2202, 3204, and 3206 Sangren Hall. The Sangren Hall computer labs will also have general open hours each week (normally 8 am to 3 pm). Other University Computer Labs also exist around campus. Students are also encouraged to get access to a personal computer.

EDT 347 Attendance Policy

Attending lecture and lab classes is seen as a valuable part of completing the course successfully. Students will be rewarded with lecture and lab attendance with 3 points each week. In each lab or lecture an attendance sheet will be available for students to sign. Students are responsible for signing their own name to the sheet in a legible form (PLEASE PRINT). Remember to turn in the attendance sheet to the lab instructor or to one of the lecture hall presenters.

The attendance process is also seen by the instructors as a way to gather formal and informal feedback on class activities, assignments, grading issues, etc. An open comment section for student issues or concerns is also provided. Please provide your comments! Comments as also encouraged via email messages to the instructors.

Email Account Requirement

Students are required to obtain an email account for the course. If you do not already have an email account we encourage you to obtain one via the University Unified Computer Accounts and/or from one of the many free email services on the World Wide Web such as Hotmail.com or Yahoo.com. Using a Web client such as Netscape Navigator or Microsoft Explore visit the email site and sign up for an email account. Instructors in EDT 347 will NOT provide temporary class email accounts for Fall semester!

EDT 347 WebCT Course Site

Students are required to use the WebCT site for course communications and announcements, for grading information, and for access to other course related resources. You will be provided a WebCT account with a password (this will be the same as your Western Unified Computer Account!)

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Taskstream Accounts (Taskstream.com)

Students are required to get an account with the http://taskstream.com/ Lesson Planning site. Information will be provided to students in class for subscribing to this service. The service will cost the student $20 per semester and must be paid for with a credit card at the time of registration. Students should contact Taskstream directly at their 800 number (1-800-313-5656) for specific questions. It is possible to get a year-long account for $40, a two year account for $80, and a four year account for $100. The normal rate for teachers is $40 per year.

Academic Integrity

You are responsible for making yourself aware of and understanding of the policies and procedures in the Undergraduate (pp. 271-272) Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Judicial Affairs. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.

Computer Use Policies

You are responsible for making yourself aware of and understanding of various computer use policies adopted by the University (http://www.wmich.edu/oit/policies/webpolicy.html). Appropriate computer use in EDT 347 will follow these guidelines.

Top of Page, Instructors, Course Goals/Competencies, Course Schedule, Lecture Summary, Assignments, Assignment Points, Grading Scale, Related Items

Coded by Howard Poole - August 28, 2002
Send Comments to: mailto:poole@wmich.edu

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INSTRUCTOR

Name: Carmen Comieles
Address: 3419 or 3506 (mailbox) Sangren Hall
Phone: 387-5936 (leave message)
Email: carmen.comieles@wmich.edu
Office Hours: By appointment (will be on campus Monday’s, Tuesday’s, Wednesday’s and Thursday’s)

REQUIRED TEXTBOOK/MATERIALS


COURSE DESCRIPTION

Prerequisite: Consent of the Department.

This course is designed to provide specific information, exposure, and experience related to a variety of ways that current and emerging technologies may be used to improve the education and lives of learners with disabilities.

Students who are NOT familiar with the computer and its components (i.e. the mouse, saving to disk, sending and receiving email) and accessing the Internet, MAY need to spend extra time at the beginning of the course becoming familiar with the hardware and the Internet. Students should be comfortable with using a word processor program. Students need to be prepared to take risks and explore new technologies.
The special education Undergraduate Programs will prepare undergraduate students to:

1. Work effectively with parents.
2. Use interdisciplinary communication skills associated with a teacher consultant role.
3. Provide quality educational services to students with disabilities in the state, region, and nation.
4. Implement the Clinical Teaching Model in their educational programs serving students with disabilities.
5. Function as a resource for regular educators serving students with disabilities.
6. Serve as a resource for parents/guardians of students with disabilities.
7. Serve as advocates for students with disabilities in our society.
8. Function as professionals in the field of education.
9. Be critical consumers of current and emerging educational techniques and technologies.
10. To demonstrate knowledge regarding the issues and needs of traditionally underrepresented populations.

COMPETENCIES

The competencies for the course are taken from the CEC Common Core of Knowledge and Skills.

I. PHILOSOPHICAL, HISTORICAL, AND LEGAL FOUNDATIONS OF SPECIAL EDUCATION.

Undergraduate Special Education

Knowledge:

1. Models, theories, and philosophies that provide the basis for special education practice.

3. Issues in definition and identification procedures for individuals with exceptional learning needs including individuals from culturally and/or linguistically diverse backgrounds.

5. Rights and responsibilities of parents, students, teachers and other professionals, and schools as they relate to individuals with learning needs.

Skills:

Clinical Teacher

Knowledge:
1. Models, theories, and philosophies that provide the basis for special education practice.

3. Issues in definition and identification procedures for individuals with exceptional learning needs including individuals from culturally and/or linguistically diverse backgrounds.

5. Rights and responsibilities of parents, students, teachers and other professionals, and schools as they relate to individuals with learning needs.

Skills:

II. CHARACTERISTICS OF LEARNERS

Undergraduate Special Education

Knowledge:
1. Similarities and differences among the cognitive, physical, cultural, social, and emotional needs of individuals with and without exceptional learning needs.

Skills:
1. Access information on various cognitive, communication, physical, cultural, social, and emotional conditions of individuals with exceptional learning needs

Clinical Teacher

Knowledge:
1. Similarities and differences among the cognitive, physical, cultural, social, and emotional needs of individuals with and without exceptional learning needs.

Skills:
1. Access information on various cognitive, communication, physical, cultural, social, and emotional conditions of individuals with exceptional learning needs

III. ASSESSMENT, DIAGNOSIS, AND EVALUATION

Undergraduate Special Education

Knowledge:

Skills:

1. Evaluate supports needed for integration into various program placements.
Clinical teacher

Knowledge:

Skills:

1. Evaluate supports needed for integration into various program placements.


IV. INSTRUCTIONAL CONTENT AND PRACTICE

Undergraduate Special Education

Knowledge:

Skills:

4. Choose and use appropriate technologies to accomplish instructional objectives and to integrate them appropriately into the instructional process.

Undergraduate Mental Retardation Developmental Disabilities

Knowledge:

2. Assistive devices for individuals with special needs.

Clinical Teacher

Knowledge:

Skills:

4. Choose and use appropriate technologies to accomplish instructional objectives and to integrate them appropriately into the instructional process.

Special Education Administration

Skills:

3. Develop and implement a plan that provides a wide array of instructional and assistive technologies for learning environments.

V. PLANNING AND MANAGING THE TEACHING AND LEARNING ENVIRONMENT

Undergraduate Special Education

Knowledge:
3. Ways in which technology can assist with planning and managing the teaching and learning environments.

Skills:

**Clinical Teacher**

Knowledge:

3. Ways in which technology can assist with planning and managing the teaching and learning environments.

Skills:

**Special Education Administration**

Skills:

4. Develop and implement professional development programs for individuals, school sites, and district personnel that reflect teacher development research and strategies and include use of technology.

VI. MANAGING STUDENT BEHAVIOR AND SOCIAL INTERACTION SKILLS

**Undergraduate Special Education**

Knowledge:

4. Strategies for preparing individuals to live harmoniously and productively in a multiclass, multiethnic, multicultural, and multinational world.

Skills:

**Clinical Teacher**

Knowledge:

6. Strategies for preparing individuals to live harmoniously and productively in a multiclass, multiethnic, multicultural and multinational world.

VII. COMMUNICATION AND COLLABORATIVE PARTNERSHIPS

**Undergraduate Special Education**

Knowledge:

4. Roles of individuals with exceptionalities, parents, teachers, and other school and community personnel in planning an individualized program.

Skills:

**Clinical Teacher**

Knowledge:
4. Roles of individuals with exceptionalities, parents, teachers, and other school and community personnel in planning an individualized program.

VIII. PROFESSIONAL AND ETHICAL PRACTICES

Undergraduate Special Education

Knowledge:

Skills:

5. Demonstrate proficiency in oral and written communication.

8. Use copyrighted education materials in an ethical manner.

9. Practice within the CEC Code of Ethics and other standards and policies of the profession.

Clinical Teacher

Knowledge:

2. Importance of the teacher serving as a model for individuals with exceptional learning needs.

MODES OF INSTRUCTION

1. Didactic/lecture

2. Small and large group discussion and activities

3. Technology enhanced instruction (e.g., computerized presentations, video viewing and recording).

4. Guest speakers/panels

COURSE REQUIREMENTS

1. ATTENDANCE: Students are expected to attend all classes and labs. Class moves very quickly and materials necessary to complete the assignments will be presented in class. If you get behind on the assigned materials you may have difficulty keeping up with the pace of the class. If you must miss class or lab, please arrange for someone to take notes for you. I will be demonstrating and presenting many assistive technology devices that will not be available in the lab at any other time than during the specific class period. There will be no attendance grade...I’ll just try to make class interesting enough so that you will want to attend everyday!

2. QUIZZES: Quizzes will be given at the end of class. As long as you are in class, you may take the quiz; there will be no provision for make-up quizzes. At the end of the semester, the lowest of 9 quiz scores will be dropped automatically (so you can miss one quiz with no penalty). Quizzes will usually consist of a single
question requiring a short (paragraph) answer. Content will relate to the assigned readings and/or class discussion for that day.

3. **ASSIGNMENTS:** Assignments are due at the start of class on the assigned date. Ten Percent (10%) of the total points will be deducted for each day an assignment is late. All assignments must be completed individually unless otherwise indicated. The last date that any late assignment will be accepted is the day of the final exam. See the section on Assignments for a complete description of each.

4. **MIDTERM and FINAL EXAMS:** There will be two written exams, one at midterm and one at the end of the semester. The midterm will address content covered during the first half of the semester, namely general educational technology. The final will focus on content addressed during the second half of the semester, namely assistive technology. Both exams will consist primarily of objective questions, but will also contain a few items requiring short answers.

5. **COMPUTER ACCOUNTS:** Students are provided a unified personal WMU account on the WMU computer system. This account will be used to send and receive course-related email and obtain class assignments and materials. This personal WMU account will terminate automatically at the end of the last registered semester that you attend WMU. You will need to have a personal unified account to obtain space on the server for your electronic portfolio.

6. **BONUS POINTS:** Five extra points will be awarded to students who respond to a surprise "bonus point" email message by a specified date. I will send this message sometime during the semester (when you least expect it) so check your email regularly!

### Grading

<table>
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<tr>
<th>Assignments</th>
<th>Points</th>
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<tr>
<td>Assignment #1</td>
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<td>Assignment #10</td>
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<td>Assignment #11</td>
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<td>Assignment #12</td>
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<td>Quizzes (8 graded @ 5 points each)</td>
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<tr>
<td>Midterm</td>
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<td>Final</td>
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**Total** 700 points

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SPED 537  
Fall 2001  
Carmen Cornicles  
Western Michigan University
COURSE GRADE CRITERIA

<table>
<thead>
<tr>
<th>Undergraduate Students</th>
<th>Grade</th>
<th>Graduate Students</th>
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<tr>
<td>93%-100% (Total Possible Points)</td>
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<td>95%-100% (Total Possible Points)</td>
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<tr>
<td>88%-92% (Total Possible Points)</td>
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<td>90% - 94% (Total Possible Points)</td>
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<tr>
<td>83%-87% (Total Possible Points)</td>
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<td>78%-82% (Total Possible Points)</td>
<td>CB</td>
<td>80%-84% (Total Possible Points)</td>
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<td>73%-77% (Total Possible Points)</td>
<td>C</td>
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<td>68%-72% (Total Possible Points)</td>
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<td>63%-67% (Total Possible Points)</td>
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<td>Below 62% (Total Possible Points)</td>
<td>E</td>
<td>Below 74% (Total Possible Points)</td>
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</table>

NEED FOR ACCOMMODATIONS

Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the professor and the appropriate Disability Services office at the beginning of the semester. The two disability service offices on campus are: Disabled Student Resources and Services 616.387.2116 or Office of Services for Students with Learning Disabilities 616.387.4411

DIVERSITY STATEMENT

The Department of Educational Studies, Special Education Program maintains a strong and sustained commitment to the diverse and unique nature of all learners and to maintain high expectations for each student.

STUDENT ACADEMIC CONDUCT

Western Michigan University’s academic honesty and conduct in research policies have been created and defined by members of its academic community, recommended by its faculty senate, and adopted by its board of trustees. The Department of Educational Studies will adhere to all Student Academic Conduct polices and procedures as printed in the catalog. The processes necessary to support these policies are managed and facilitated by the Office of Student Judicial Affairs. All questions related to academic honesty will be referred to this office (387-2160).

APA STYLE

The Department of Educational Studies, Special Education Program has officially endorsed the style of the American Psychological Association (APA) for the completion of all written assignments unless otherwise stated. APA writing procedures are found in:

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic(s)</th>
<th>Readings Due</th>
<th>Quiz #</th>
<th>Asg. Due</th>
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<tbody>
<tr>
<td>1</td>
<td>Wed 8-29</td>
<td>Course overview&lt;br&gt;Blackboard&lt;br&gt;Profiler&lt;br&gt;Educational Technology&lt;br&gt;Assignment #1: Blackboard &amp; Profiler</td>
<td>Chpt 1 p. 4-27</td>
<td>none</td>
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<td>2</td>
<td>Wed 9-5</td>
<td>Introduction to Special Education Technology&lt;br&gt;Computer Hardware&lt;br&gt;Methods of Communication: Email, Learning Theories&lt;br&gt;World Wide Web&lt;br&gt;Library Access&lt;br&gt;Keebooks Demo&lt;br&gt;Assignment #2: Definition of Education Technology&lt;br&gt;Assignment #3: E Greeting Card</td>
<td>Appendix p. 322-328&lt;br&gt;Chpt 2 p. 28-47&lt;br&gt;Chpt 3 p. 48-76</td>
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<td>3</td>
<td>Wed 9-12</td>
<td>Distance Learning&lt;br&gt;Internet In Education&lt;br&gt;Multimedia and Hypermedia&lt;br&gt;Evaluating Educational Software&lt;br&gt;Copyright Issues&lt;br&gt;Assignment #4: Computer Hardware&lt;br&gt;Assignment #5: Journal Article Presentations</td>
<td>Chpt 4 p. 80-111&lt;br&gt;Chpt 7 p. 191-206&lt;br&gt;Chpt 8 p. 207-228&lt;br&gt;Chpt 9 p. 228-239</td>
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<td>Wed 9-19</td>
<td>Application Software&lt;br&gt;Microsoft Power Point Demo&lt;br&gt;Microsoft Access Demo&lt;br&gt;Assignment #6: KeeBooks</td>
<td>Chpt 5 p. 112-165</td>
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<td>Wed 9-26</td>
<td>Application Software Continued&lt;br&gt;Multimedia and Hypermedia&lt;br&gt;Assignment #7: Software Evaluation</td>
<td>Chpt 6 p. 164-188</td>
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<td>Wed 10-3</td>
<td>Hyperstudio Demo&lt;br&gt;Assignment #8: Database</td>
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<td>Wed 10-10</td>
<td>Integrating Technology into the Curriculum&lt;br&gt;Technology in Special Education&lt;br&gt;Legal Aspects&lt;br&gt;IEP&lt;br&gt;Various Disabilities&lt;br&gt;Assignment #9: Power Point</td>
<td>Chpt 10-14 p. 239-306&lt;br&gt;Chpt 15 p. 307-321</td>
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<td>Class</td>
<td>Date</td>
<td>Topic(s)</td>
<td>Readings Due</td>
<td>Quiz #</td>
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</table>
| 8     | Wed 10-17| Electronic Portfolio Demo  
                   Dreamweaver Demo  
                   Assignment #10: AT on the Web |              | 5      | 10       |
| 9     | Wed 10-24| MIDTERM EXAM  
                   Low Tech Devices  
                   Microswitches  
                   High Tech Devices | TBA (To Be Announced) | None   | None     |
| 10    | Wed 10-31| Assistive Technology for Individuals with Mental Impairments and Physical Impairments  
                   Assignment #11: HyperStudio Presentation | TBA          | 6      | 11       |
| 11    | Wed 11-7 | More Assistive Technology for Individuals with Physical Impairments  
                   Modifying the Keyboard  
                   Alternative Keyboards | TBA          | 7      | none     |
| 12    | Wed 11-14| Computer Environmental Control Units  
                   Assistive Technology for Individuals with Communication Impairments  
                   Assistive Technology for Individuals with Sensory Impairments – VI/HI  
                   Assistive Technology for Individuals with Learning Disabilities - LD | TBA          | 8      | none     |
| 13    | Wed 11-21| No Class  
                   Thanksgiving Break |              |        |          |
| 14    | Wed 11-28| Assistive Technology for Individuals who are EI / AI / TBI / Gifted  
                   Integration of Technology  
                   Funding Assistive Technology  
                   Troubleshooting Resources  
                   Assignment #12: Electronic Portfolio | TBA          | 9      | 12       |
| 15    | Wed 12-5 | FINAL EXAM | TBA |        |          |
BIBLIOGRAPHY


Hartmann, D. J., & Finley, L. (2002). PT3 evaluation: Year two.


