2009

An Examination of the Impact of Attending an Electronic Technology Rich Program on the Teaching Styles of Senior Student Teachers

Joseph J. Martinelli
Seton Hall University

AN EXAMINATION OF THE IMPACT OF ATTENDING AN ELECTRONIC TECHNOLOGY RICH PROGRAM ON THE TEACHING STYLES OF SENIOR STUDENT TEACHERS.

BY

JOSEPH J. MARTINELLI

Dissertation Committee

Rebecca Cox, Ph.D, Mentor
Grace May, Ph.D
Mark DelMaramo, Ph.D
Anthony Lanzo, Ed.D

Submitted in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education
Seton Hall University

2008

SETON HALL UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN SERVICES
OFFICE OF GRADUATE STUDIES

APPROVAL FOR SUCCESSFUL DEFENSE

Doctoral Candidate, **Joseph Martinelli,** has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ed.D.** during this **Fall Semester 2008.**

DISSERTATION COMMITTEE
(please sign and date beside your name)

Mentor:
Dr. Rebecca Cox _____ 1·21·09

Committee Member:
Dr. Grace May _____ 12-18-08

Committee Member:
Dr. Mark DelMaramo _____

Committee Member:
Dr. Anthony Lanzo _____ 12-18-08

External Reader:
_____

The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

SETON HALL UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN SERVICES
OFFICE OF GRADUATE STUDIES

APPROVAL FOR SUCCESSFUL DEFENSE

Doctoral Candidate, **Joseph Martinelli,** has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ed.D.** during this **Fall Semester 2008.**

DISSERTATION COMMITTEE
(please sign and date beside your name)

Mentor:
Dr. Rebecca Cox _____

Committee Member:
Dr. Grace May Grace M May 12-18-08

Committee Member:
Dr. Mark DelMaramo Mark J DelMaramo 1-15-09

Committee Member:
Dr. Anthony Lanzo Anthony Lanzo 12-18-08

External Reader:
_____

The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

ACKNOWLEDGEMENTS

I would like to acknowledge the following people for their help and guidance through this project. First would like to thank my wife Lysa, for all of her support, not just with this project but for everything that I do in my life. Secondly, I have to thank my son Joseph, who during this process has grown from a child into an outstanding young man. I love you both more than you can imagine.

My unquenchable thirst for the written word was instilled in me as a child by my parents Joe and Shirley Martinelli. They instilled a strong work ethic that enabled me to complete the dissertation process. Dad, I know you are beaming with pride as you watch over me from above; I miss you and love you very much.

As for all my New Jersey friends and family, I want to thank each of you for supporting me throughout this endeavor. To my New Jersey Mom and Dad, Caroline and John, you have always shown interest in my educational studies, offered me love and support throughout the process and I love you both.

Professionally, I've been very lucky to have worked with some truly splendid individuals. To my friends at William Paterson University, where I spent 15 years of my life, thank you for the constant encouragement. As for my Seton Hall University family, you welcomed me with open Pirate arms in 2001 and the support you've provided over the years is very much appreciated.

DEDICATION

In 1992, I became a very lucky man and married the love of my life, my wife Lysa, one year later our son Joseph was born and in the 17 years since our life together began we have had an interesting journey. A journey filled with laughter, love, tears, and joy. It hasn't always been fun, but it has always been an adventure. Adventure is good, as it keeps you young and full of desire. Therefore I dedicate this dissertation to my wife Lysa, son Joseph, and two loyal furry companions Buster and Hunter, who spent countless hours at my side as I typed away.

Abstract

An Examination of the Impact of Attending an Electronic Technology Rich Program on the Teaching Styles of Senior Student Teachers.

By

Joseph J. Martinelli

The purpose of this study was to determine whether attending an electronic technology rich program had an impact on the teaching styles of senior student teachers. It is clear from this research that senior student teachers have benefits from attending such a program. Three research questions were used to guide this study: what ways teachers are currently using technology; how are teachers in this study using technology in their planning of the learning experience; how teachers' technology attitudes, understandings and skills change over time. A web based survey tool, which was delivered electronically to senior student teachers both in elementary and secondary environments. The survey instrument consisted of 34 questions and was comprised of four parts and designed to have two measurement properties, labeled categories (nominal scale) and variable differences (interval scale). Collected data showed a willingness on the part of the senior student teachers to use electronic technologies, as well as a possessing a strong comfort level using multiple electronic technologies and software applications such as Word and PowerPoint. While the two software applications least likely to be used by senior student teachers were spreadsheet applications such as Excel and database applications like Access. The infusion of electronic technologies into lessons and curriculum was quite strong but data showed varied results as to how senior student teachers view the effect of such infusion. Nearly all respondents agreed that PowerPoint is an effective tool in both lesson planning and presentation by both students and teachers alike. Recommendations for future research include should take place on either an annual of semi-annual basis, in addition to extending the participant audience to include junior pre-service teaching candidates.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The whole art of teaching is only the art of awakening the natural curiosity of young minds for the purpose of satisfying it afterwards.

Anatole France

Electronic Technology and its use in the K-12 classroom has had a consistent and steady growth since the first appearance of classroom computers in the 1970's (Puma, Chaplin & Pape, 2000). Norton and Wiburg (2003) stated that electronic technologies can and should become an integral part of the teaching and learning process in schools just as they are being integrated throughout nonschool learning experiences. In this way teachers can serve to support the learning process by guiding students into becoming skillful adults who can competently access and use available electronic technologies.

The New Jersey Department of Education (NJDOE) requires all students to have an understanding and be comfortable with the use of technology both as an end user in a classroom environment and as a productive adult member of our society.

When it comes to the comprehension of both the nature and impact of technology, the New Jersey Core Curriculum Content Standards for Technological Literacy expect students to leave 12th grade with a solid grasp of how technology is influencing the way our world functions. This includes both environmental impacts, and the various limitations that may take place with the use of technology. From a teaching perspective, the need for technology standards is quite valid, but the implementation and meeting of the standards and subsequent strands often prove to be hard to achieve.

Technology in the classroom is often associated with computers and the peripheral hardware and software that accompany its use. Other equipment often

associated with technology are: VCRs, DVD players, smart-boards, and overhead projectors. It is commonplace to discover teachers using technology for a variety of purposes, including record-keeping, accessing lesson plans, creating study guides, and communicating with parents. Students too, are found busy employing technology to compose reports, analyze data, communicate with experts, and perform research (Judson, 2006). Nevertheless, even with the wide-spread availability of electronic technologies and the acknowledgment of its benefits, teachers do not necessarily integrate more electronic technologies into their lessons?

The integration of technology is not necessarily a subject area nor a curriculum. Technology in and of its' self is simply a tool, that can be used to help improve instructional strategy. Just like the pencil and the calculator before it, technology is a tool for delivering subject matter in the curriculum that already exists.

The Internet, in the form that most people are familiar with, has been around for nearly 17 years, while having formal beginnings with the ARPANET (Advanced Research Projects Agency Network) during the Cold War 1960's. In 1991, an early WWW system was released to the high energy physics community via the CERN, CERN is the European Organization for Nuclear Research, program library. It included the simple browser, web server software, and a library, implementing the essential functions for developers to build their own software. A wide range of universities and research laboratories started to use it. A little later it was made generally available via the Internet, especially to the community of people working on hypertext systems (CERN - Web Communications, 2008).

Microsoft Office Applications and personal computers have been in schools in various forms for over 20 years, and the infrastructure to utilize these applications and tools has been in place in most school districts for nearly 10 years. While the availability of technology has become commonplace in many schools, the use of it as an instructional tool by educators has not grown at the same pace. As teachers grow in comfort with the use of technology as a tool, an increase of productive technology based materials should develop.

Woodbridge (2004) found that in educational settings where adequate access to technology was present, teachers used a variety of teaching strategies, but a large amount of those strategies were constructivist. Technology was used for reinforcing content, but more often became a seamless instructional tool used to explore, construct, present, and enhance the curriculum. But when successfully integrated into the curriculum, as other than a tool to assist in the completion of an activity or lesson, technology became integrated, engaging and served to encourage independent student exploration, which can lead to the fulfillment of Bloom's six levels of cognitive domain.

The Problem

With pressure from the NJDOE for greater integration of technology by teachers into the curriculum and without commensurate use in the classroom, the question remains: "What is hindering the process and how can the situation be remedied?"

To begin answering this question, this study will focus on issues affecting integrating technology into the teaching styles of Seton Hall University senior student teachers and graduates. The main issue addressed is not whether senior student teachers

of Seton Hall University use technology, but instead, is what way are they using technology and why is it being used in that particular way?

The problem facing integration of technology into the curriculum is defined by three fundamental questions each of which must be answered prior to and during technology integration.

1. What ways are teachers currently using technologies?
2. Has their pre-service education provided them with the skills needed to integrate technology infused lessons?
3. Are technology tools available in their classroom environment or technology labs?

Graduates of teacher preparation programs will be faced with the expectations of the community and administration of the school district in which they are placed or employed. A large obstacle that may be hindering a comprehensive integration is the confidence levels of the teachers to utilize available tools to the maximum extent available. To help speed this process, electronic technology savvy teachers might be identified as technology "superstars" who will be able to assist colleagues in the integration process. Fulton, Glenn and Valdez (2003) found that new teachers entering schools are confident and ready to use technology as a tool for instruction and are generally prepared for the culture of the urban or rural schools in which they are teaching. This technology skill set is valuable to both senior students and second year teachers, and will serve to support integrating technology into the curriculum.

Quality of technology implementation will be a major concern of veteran teachers, when it comes to working as colleagues with newer more tech savvy peers. In a study by

Fulton, Glenn and Valdez (2003) it became apparent that veteran teachers involved in their study acknowledged and welcomed the technology expertise of new teachers and recent graduates. While novice teachers have much to learn in other areas of teaching and managing in the classroom, technology expertise gives them a chance to shine among their more senior colleagues. It is a phenomenon that appears to be unique to the area of technology.

Technology integration enables teachers to construct realistic problem-based lessons that can connect with societal issues facing today's student. The use of technology tools in the acquisition of facts and transfer of knowledge can stimulate higher-order thinking. Computers allow students to process a great deal of information in complex ways that were not available to them prior to the advent of computing (Thorsen, 2006).

The Research Questions

Research Question 1: In what ways are teachers currently using technology?

Research Question 2: In what ways do teachers in this study use of technology tools in the planning of learning experiences?

Research Question 3: How do teachers attitudes, understandings, and skills related to technology use change over time?

Subsidiary Questions

How has teacher subject specialization influenced technology integration?

What is the relationship of teacher training with technology tools have on technology integration?

How can access to technology tools (both in classroom and resource labs) influence technology integration?

Conceptual Framework

In this study the researcher will analyze the relationship between the levels of technology integration into the curriculum by Seton Hall senior student teachers. The researcher will examine in the ways that teachers integrated technology into their curriculum and the extent of its effectiveness. To guide the aforementioned analysis, three primary research questions and four subsidiary questions have been developed. These questions will provide a framework to develop an understanding as to what extent technology integration into the curriculum has taken place, as well as what steps or procedures were implemented to improve technology integration. The conceptual framework will focus on the integration of technology into the curriculum. The learning/adoption trajectory research based model used by Sherry, Billig, Tavalin and Gibson (2000) was created to evaluate K-12 teacher's technology use level. In the questionnaire used in this quantitative study, the learner/adoption trajectory was used as a framework to define technology adoption by Seton Hall University senior student teachers and graduates in their second year in the field. The first three stages will serve as the vision and blueprint of the survey tool in addition to providing indicators to follow while designing potential solutions. Seton Hall's education majors are experience the first three stages when they take any of the following required or elective courses: Computer Fundamentals (required course for all elementary education majors), Integrating Technology into the Curriculum (required course for secondary education majors), and available electives such as Production I & II, and Web Page Technologies.

The stages of this model are described next:

Stage 1. Teacher as a Learner: In this information-gathering stage, teachers learn the knowledge and skills necessary for performing instructional tasks using technology.

Stage 2. Teacher as Adopter: In this stage, teachers progress through stages of personal task management concern as they experiment with technology, begin to try it out in their classrooms and share their experiences with their peers.

Stage 3. Teacher as Co-Learner: In this stage, teachers focus on developing a clear relationship between technology and the curriculum, rather than concentrating on task management aspects.

Stages four and five will not be addressed in this study do to the experience levels of our research sample.

Stage 4. Teacher as Reaffirmer/Rejecter: In this stage, teachers develop a greater awareness of intermediate learning outcomes. They begin to create new ways to observe and assess impact on student products and performances, and to disseminate exemplary student work to a larger audience.

Stage 5. Teacher as Leader: In this stage, teachers, experienced teachers expand their roles to become active researchers who carefully observe their practice, collect data, share the improvements in practice with peers, and teach new members. Their skills become portable.

Purpose of the Study

The researcher will examine the effect of attending a technology rich program on the teaching styles of Seton Hall University senior student teachers. The researcher will

also examine what ways teachers have integrated technology into their curriculum and to what extent has it been effective.

Specifically, questions addressed will be: What is hindering the technology integration process and, if teachers have integrated it, what steps were taken to make the process more manageable? What were the expectation levels of teachers who have already introduced technology into their classroom instruction, and has technology enabled them to reach desired levels?

Significance of the Study

The need to develop an effective integration of technology process will advance as teachers develop a greater sense of self-efficacy, regarding learning and performing actions with newly developed technology skills. The relationship between skill level, performance self-efficacy and integration of technology into the curriculum is reciprocal in nature. Teachers need to be encouraged to share with their peers what goals they want to accomplish in their classrooms, and this includes barriers that hinder their work, and instructional or administrative concerns. A reassurance by district administrators to teachers, stressing that technology integration will serve to strengthen the education process while enhancing the transfer of knowledge to students, must take place.

As globalization and improvements in the technological infrastructure transform the way our society works together, the need for students to have a solid foundation of technology skills and understanding is indisputable. The first step to making sure that our students have this skill base begins with their teachers having the ability to integrate technological skills and techniques into their lessons. In colleges and universities throughout our country pre-service teachers are being educated with the skills and

techniques on how to use technology and various levels in their lesson planning. To be effective in using educational technology in their classrooms, teachers must be computer literate, information literate, and most importantly integration literate (Shelly, Cashman, Gunter & Gunter, 2008).

The learning/adoption trajectory model (Sherry et al., 2000) will serve as the central theoretical structure in the analysis of the data in the study. The intent of this study is to indentify how Seton Hall University senior student teachers and graduates of the program use electronic technology for instructional purposes and what factors influence their use of such devices. The criterion variable for this study was how much and in what ways teachers are using technology.

An electronic survey instrument will collect data about the following conditions: teacher use of technology, skill levels in using technology, how technology is used in classroom lessons, and teacher demographic data. The survey will be beta tested by Seton Hall University junior and senior level pre-service teachers who are enrolled in the course Integrating Curriculum and Technology. This will help ensure survey reliability prior to its distribution to survey participants.

Seton Hall University and the College of Education (COE) have dedicated to ensuring that their professional preparation programs are based on essential knowledge, evolving technology, research findings, and reflective practice. Seton Hall University encourages and financially supports comprehensive efforts to improve teaching and learning using technology. The COE seeks to prepare technology-proficient classroom teachers who can develop pedagogically sound plans for integrating technology into their

classroom environments, and it requires its pre-service students to take at least one technology based course.

Survey of Evidence

An electronic Web-based survey instrument developed using the Asset Survey Tool was constructed after review of the research literature on current trends in technology integration into the curriculum. Survey questions were designed to address factors that contribute to classroom teacher's use of electronic technology. Three test instruments, Predicting Pre-service Teacher Competence in Computer Technology (Fleming, Motamedi & May, 2007), Teaching, Learning and Computing: 1998 Survey (TLC) (Becker & Anderson, 1998) and the Technology Implementation Questionnaire (TIQ) (Abrami, Wozney & Venkatesh, 2006) were used to develop the survey. Several Seton Hall specific questions were also included in the survey instrument. The survey is composed of three parts and the first part will sought information regarding survey participants' perceptions of their electronic technology skills. Part 2 of the survey asks respondents if their cooperating teachers, practicum instructors, professional mentors, and university instructors used electronic technologies in the classroom. Part 3 of the survey sought respondent information regarding previous technology courses taken while at Seton Hall University and personal demographics. The survey instrument will be delivered electronically via e-mail in which a link will be placed. The link will take participants to a Web-based survey (http://asset.tltc.shu.edu/servlets/asset.AssetSurvey?surveyid=698) which is password protected. The password was "technology." The subject's consent to participate in the survey will be witnessed by their clicking on the link to begin the survey.

Limitations of the Study

Sample size is a limitation. The research population for this study was student teachers enrolled at Seton Hall University. Another limitation may included the response rate of surveys. Participants were not required to complete the survey, but were encouraged to do so by letting participants know how important their feedback was to Seton Hall's teacher preparation program. The survey was administered electronically via email and took participants approximately 20 minutes to complete. All survey participants were given 7 days upon delivery to complete the survey. Those who have not completed the survey within the 7 day period were sent a reminder e-mail to complete the survey.

Organization of the Dissertation

Chapter 2 reviews the related literature on technology and pre-service teacher training. The need for technology, integration roadblocks, technology availability, integration techniques, technology as a teaching tool, pre-service teachers and technology, and teachers using technology are discussed.

Chapter 3 addresses the methodology of the study. This chapter includes an introduction, a discussion of the population, instrument design, research procedures, data collection techniques, background on participants, and data analysis.

Chapter 4 presents the research findings using a qualitative analysis of the survey tool. Research questions are presented in a mixed method electronic survey. Frequencies and percentages will be pulled for qualitative statistical analysis purposes.

Chapter 5 presents a summary, the conclusions, the implications of the study and recommendations for policy, practice and research.

Definition of Terms

Education Rate (E-Rate): Federal Communications Commission government initiative designed to provide discounts to schools and libraries on all communication services including network installation and Internet access.

ISTE (International Society for Technology in Education): leading nonprofit organization that promotes the use of technology to support and improve teaching and learning.

Teacher Experience: The number of years a teacher has been teaching.

Teacher subject specialization: Subject area or areas a teacher is assigned to teach, such as English/language arts, history, science, math, foreign language.

Technology: In this study, technology is defined as computer hardware, software, World Wide Web, digital and analog video, and DVD audio recording.

Technology Integration: Technology is used as an integral component or tool for learning and communications within the context of academic subjects.

Technology Plan: In this student the technology plan referrers to and outline that specifies a school district's procedures for purchasing equipment and software, and the training of teachers to use and then integrate technology into the curriculum.

CHAPTER II

REVIEW OF LITERATURE

While exploring the ways Seton Hall University senior student teachers are using technology and why it is being used in that particular way, an examination of current literature provides insight into the following areas: the need for technology, integration road blocks, technology availability, integration techniques, technology as a teaching tool, pre-service teachers and technology, how teachers can use technology, and summary.

The problem facing integration of technology into the curriculum is defined in this study by three fundamental questions: (a) In what ways are teachers currently using technology?; (b) In what ways are teachers using technology tools in the planning of learning experiences?; (c) How do teachers attitudes, understandings, and skills related to technology use change over time. The review of current literature offers a valuable insight into the trends and issues facing pre-service teachers when it comes to technology integration.

The Need for Technology

Our nation is at a turning point. We know that the world in which our education system was created - the industrial world of the 19th and early 20th centuries - no longer exists. Today we live in a technology-driven global marketplace where ideas and innovation outperform muscle and machine. In an age of digital content and global communications, we must build an education system that meets the new demands of our time. Technology can help us create schools where every child has the opportunity to succeed, while we work to close the achievement gap and address the economic and workforce needs of the future. (NCES, 2008)

The U.S. Department of Education has played a variety of roles to encourage K-12 use of technology. Funding has subsidized research, encouraged the development of

projects demonstrating innovative uses of technology, and addressed equity issues associated with the availability of technological resources. (Grabe & Gabe, 2004). In 1999, the Department of Education launched a program entitled Preparing Teachers to Use Technology (PT3), and the thrust of the program was to change how teachers were prepared to teach, and in turn to change how they will teach.

Technology also changes the way teachers teach, offering educators effective ways to reach different types of learners and assess student understanding through multiple means. It also enhances the relationship between teacher and student. When technology is effectively integrated into subject areas, teachers grow into roles of adviser, content expert, and coach. Technology helps make teaching and learning more meaningful and fun (Edutopia, 2008). While technology can make learning more meaningful, there are a variety of barriers that limit the effective integration of technology.

Integration Roadblocks

The 2007 U.S. Department of Education's (DOE) Educational Technology in Teacher Education Programs for Initial Licensure Statistical Analysis Report asked 4 year institutions with teacher education programs for initial licensure to indicate the extent to which various barriers hindered teacher candidates' ability to practice educational technology-related skills and knowledge during their field experiences. Their findings suggested that while most institutions (79 percent) reported that educational technology was taught to at least to some extent within the field experiences of teacher candidates many of these institutions also reported a variety of barriers that limited the effectiveness of the candidate's efforts.

The barriers to effective technology skill integration consisted of competing classroom priorities, availability of a technology infrastructure, and lack of skill training, time, and

willingness to use technology. The DOE report stated that 4 year institutions with teacher education programs for initial licensure were also asked to specify the extent to which teacher candidates were able to practice the technology-related skills and knowledge they acquire in their coursework during their field experiences. Overall, although about one-third (35 percent) of the institutions reported too much variation from school to school to generalize, nearly one-half (48 percent) of the institutions reported that the teacher candidates were able to practice technology related skills.

The DOE study findings suggested that while institutions with teacher education programs for initial licensure were oriented toward preparing their teacher candidates to use educational technology, many reported a range of barriers that impeded these efforts within both program coursework and field experiences. How graduates of Seton Hall University's teacher preparation program have been affected by such barriers will be interesting to explore in collected data. Seton Hall has been at the forefront of pre-service teacher technology preparation, requiring elementary, special education and secondary education majors to take at least one if not two technology based courses. Those selections range from a general broad based over course such as computer fundamentals and integrating curriculum and technology to specific courses such as multimedia and computer graphics.

Technology Availability

Findings of the U.S. Department of Education study (2007) suggested that as the availability of technology has grown, the manner of how teachers teach has not dramatically changed (Smerdon, Cronen, Lanahan, Anderson, Iannotti, & Angeles, 2000). On a positive note, The National Center for Education Statistics (NCES) recently reported that 45% of public schools with Internet access used wireless connections in 2005, a 13% increase from 2003. This

dramatic increase might be a result of the greater availability of wireless laptops, but the question remains as to how the World Wide Web is aiding in the transfer of knowledge. Smerdon et al. (2000) found that word processing and the creation of spreadsheets coupled with drill and practice modules continued to be the task assigned to students. So, here is the quandary, even though the technology infrastructure witnessed growth, the integration of effective technology usage by teachers has failed to match the growth. As a result the inclusion of technology skills in pre-service training is more important than ever before.

But even with the data showing a growing need for the weaving of technology into the curriculum, the infrastructure within the school environment must become solid, so that pre-service teachers can use their skill set when they enter the field. A technical infrastructure that is rich and reliable enough for people to come to depend on it for their regular work must be present. While it is a necessary developmental step, the acquisition of a technical infrastructure is not an end in itself (Gomez, Sherin, Griesdorn & Finn, 2008).

The successful development of a solid technology infrastructure will only serve to foster healthy growth in the integration of technology into the curriculum. This infrastructure will enable veteran teachers and incoming teachers to provide students with a curriculum which will help prepare them to meet future technology challenges.

There has been widespread introduction of computers into the schools in recent years. In 2003, the average public school contained 136 instructional computers. One important technological advance that has come to classrooms following the introduction of computers has been connections to the Internet. The proportion of instructional rooms with Internet access increased from 51% in 1998 to 93% in 2003. Nearly all schools had access to the Internet in 2003 (NCES, 2005). The internet and its increased availability enables technology savvy

teachers the opportunity to design lessons that take their students outside of the norm of text based learning. Web Quests, online scavenger hunts, and virtual museum tools are just a sampling of the types of learning experiences that can be designed with the use of the internet. Other technology tools that can accompany the expansion of computers in the classroom are such hardware as scanners, digital still cameras, digital video cameras and high speed and large format printers.

Integration Techniques

An important question is how many of these new ways will ever be integrated into our instruction -- or even understood by educators? If we want to move the useful adoption of technology forward, it is crucial for educators to learn to listen, to observe, to ask, and to try all the new methods their students have already figured out, and do so regularly (Edutopia, 2008). The adoption of technology by schools make it possible for students, teachers and administrators to use the same or at least similar tools to those used by people in professional practice in their own work.

Several readily available technologies like multimedia composing technologies, visualization technologies, and database search technologies are important tools of the content disciplines. An important component of technical fluency is an understanding of how to use the technical tools of the discipline in ways that are consistent with the broader community of practice (Gomez,Sherin, Griesdron & Finn, 2008). The existing technology program in the College of Education at Seton Hall has available courses in multimedia, webpage, and electronic research technologies. The technology offerings within the College of Education are strong, but it is currently lacking is a strong course in the area of database usage.

According to Gomez, e tal. (2008), an example of such a course needing database training can be found in the teaching of social studies. It is a subject area which calls for a deep technical fluency with database tools that allows one to explore original documentation for argument in the social sciences. Therefore, technically fluent teachers need to be not just aware of database and visualization tools, they should also understand how to use these tools. This fluency enables teachers to step away from the *"I stayed at a Holiday Inn Express"* cliché, to instead owning a skill set in technology use and its integration techniques.

How many of these new ways will ever be integrated into our instruction or even understood by educators? If we want to move the useful adoption of technology forward, it is crucial for educators to learn to listen, to observe, to ask, and to try all the new methods their students have already figured out, and do so regularly. Two big factors stand in the way of our making more and faster progress in technology adoption in our schools. One of these is technological, the other social (Prensky, 2006). What needs to be instilled at the pre-service level is the desire to take technology risks within lesson planning and modeling. Pre-service teachers need to lose their fear of making a mistake and worrying about project grades, and instead be willing to try something new and technological in their work. This weight is not carried on the student's shoulders alone, as professors much encourage their students to take technology risks. Only then will true technology change and integration take place at both the pre-service level and professional classroom environments.

The Oracle Education Foundation, which was created in 1995 to provide support to all academic institutions has developed a list of what they refer to as essential 21st-century skills. These skills are called the seven C's: (a) critical thinking and problem solving; (b) creativity and innovation; (c) collaboration, teamwork, and leadership; (d) cross-cultural understanding; (e)

communications and media fluency; (f) computing and information communication technology (ICT) fluency; and (g) career and learning self-reliance. When you combine the seven C's plus the three R's this equal's 21st-century learning, according to OEF's senior director Bernie Trilling (2007).

Technology as a Teaching Tool

In a study on the need of 21st Century Schools adopting 21st Century Technology, Prensky (2006) noted that if educators continue to resist digital technology, such resistance will be truly lethal to our children's education. Today's students have a tendency to gather information faster than their teachers can provide. The students of today are digital natives who were born into digital technology, while a majority of their teachers can be referred to as digital immigrants. This simply means that they learned their technology skills later in life and in many cases consider the use of technology less important than face-to-face relationships.

Nothing could be further from the truth, as technology is a tool that has no inherent or required mode of application. The role of technology in education is under the control of the teacher and is isolating only if teachers require that students work on projects or stand-alone assignments (Grabe & Grabe, 2007). As with any tool, whether a pencil or a calculator, the teacher retains the control of relationships with students.

Students can use appropriate technologies to construct and analyze problems, while building unique, creative, and valuable artifacts. In using technology-rich lessons, a powerful relationship of meaningful learning may occur between the teacher and student. A technology-integrated curriculum is technology used as an innovative and instructional tool to enhance the teaching and learning of students throughout the curriculum (Woodbridge, 2002).

Integrating technology into classroom instruction means more than teaching basic computer skills and software programs in a separate computer class. Effective tech integration must happen across the curriculum in ways that research shows deepen and enhance the learning process. In particular, it must support four key components of learning: active engagement, participation in groups, frequent interaction and feedback, and connection to real-world experts. Effective technology integration is achieved when the use of technology is routine and transparent and when technology supports curricular goals (Edutopia, 2008).

Of the four key components, teacher interaction and feedback are crucial to successful technology integration. Also the active engagement and group participation only serve to add to the social component of technology integration, which is often lacking when creating technology infused lessons or curricula.

Information presented (Hawkins, 1997) in an essay for the George Lucas Educational Foundation's (GLEF) Learn & Live resource book and reprinted by Edutopia in 2005 stated, "That as educators strive to guide students to meet higher standards and gain deeper understanding, and teachers need to become expert with a new set of skills and knowledge." The lecture-and-drill methods many current teachers learned in college are no longer adequate. Professional development in new practices and in the technological tools teachers require need to be developed and refined. Ironically, in the 10 years since Hawkins 1997 study, schools and teachers throughout our country continue to search for effective integration of technology and curriculum.

Increasingly, today's students are third-stage technology users, discovering and inventing the many ways in which the new electronic technologies support their goals and offer them new possibilities for leaning and connecting with others. Because the electronic technologies are

distributed, interactive, malleable, and often lacking central control, they are vehicles for revolutionary change in every discipline, attitude and social structure. Third-stage users recognize the new uses and goals inherent in these electronic technologies and are learning to capitalize on their possibilities (Norton, & Wiburg, 2003).

True knowledge – understanding – develops through exploration, rumination, interpretation, judgment, and the application of information. Thoughtful work on projects and problems requires roaming through complex resources, seeking inspiration, messing around, making missteps and mistakes, and experiencing serendipitous discoveries. This kind of student learning and the in-depth interactions with teachers that it entails require time. The intelligent use of technology can help provide that time (Hawkins, 1997).

Pre-Service Teachers and Technology

If pre-service teachers are to successfully integrate technology into their lessons, changes must take place within their pre-service teacher education program. Technology and how technology-rich lessons can be incorporated at all levels of the pre-service teacher educational experiences. As a University, Seton Hall is dedicated to providing all of its students with the latest in technological tools as witnessed in its mission statement. "Seton Hall students are prepared to be leaders in their professional and community lives in a global society and are challenged by outstanding faculty, an evolving technologically advanced setting and values-centered curricula." Teacher educators' guidance is important. In this process, hopefully, teacher educators' beliefs could be projected through meaningful teaching practices that are known to influence pre-service teachers' beliefs (Melek, 2008).

Teachers Using Technology

Teachers with a larger number of computers available in the classroom reported greater and more sophisticated use of technology to support the teaching and learning process than did 5% of the teachers with only one computer in their classrooms. Those teachers indicated that they assigned students computer-based activities designed to solve problems and analyze data. Conversely, 21% of the teachers with five or more computers in their classrooms reported assigning these activities to support the learning process with their students (Smerdon et al., 2000).

Those teachers who do not have the ideal computer resources or support do not need computers in the classroom to utilize technology as a tool. Some of the low-tech ways to integrated technology in the classroom include finding clip art via the computer and printing it up for use on bulletins boards, using older computer keyboards to teach keyboarding skills, downloading of lessons via the Internet to extend learning, create and online bulletin board via the classroom website (Dragula, 2005).

Applied to technology use, attitudes toward technology are expected to predict one's uses of technology. In an effort to prepare tomorrow's teachers to effectively integrate technology into teaching practices; it is necessary for teacher preparation programs to facilitate positive attitudes toward technology (Bai, & Ertmer, 2008). The teacher preparation program at Seton Hall University encourages its entire faculty to incorporate and model technology usage in their classroom, which in turn serves as a guide for Seton Hall University students to engage in useful technology practice.

Technology is not only changing the world we live in; it is changing the way we educate our children. It will continue to do so. School district leaders must develop a structure that will provide a vehicle for equipping teachers with the technology skills that are so needed. It is wonderful to discover the sometimes-surprising ways that technology is already being integrated into the education process. The more teachers learn about technology the more confidence they develop and the more proactive they will become in gaining new technology skills. When equipped with needed technology skills, teachers feel empowered (Kennedy-Kleyn, 2006)

In a recent study, Wozney, Vivek, and Abrami (2006) found that: expectancy of success and perceived value were the most important issues in differentiating levels of computer use among teachers. The personal use of computers outside of teaching activities is the most significant predictor of teacher use of technology in the classroom; and teachers' use of computer technologies was predominantly for information (World Wide Web and CD-Rom) and word processing.

There are many hurdles to overcome prior to successful technology curriculum integration, but the highest hurdle of them all may be the one to increase the level of teacher competence in using technology. The CEO Forum (2001) noted that digital and technology literacy, like basic reading literacy, is a fundamental skill that will enable advanced learning. Federal and state governments should demand basic technology literacy for all students. Nevertheless, technology literacy is not enough. Educators must also ensure that our children have the ability to move beyond basic skills to apply higher-order problem-solving skills that will be needed to compete in the new and ever changing information economy. Students must be able to use technology's tools to enhance learning; increase productivity; foster creativity; research topics online; proficiently use Web-based tools; evaluate sources; develop problem-

solving strategies; and use critical and conceptual thinking to incorporate technology into their coursework.

Student-centered approaches to learning (American Psychological Association, 1997) have encouraged teachers to modify instructional strategies and integrate computer technologies across the curriculum. The accessibility of the World Wide Web and the ever-expanding availability of interactive and collaborative instructional software applications makes new technologies dynamic and flexible learning tools.

Teaching writing is one area where technology is changing the approach that teachers are taking towards instruction. Teachers can set up their own in-classroom blogs and require students to log in and write reports or provide feedback on something the class has done. By monitoring what students post and providing corrections and constructive criticism, teachers are finding that, through participation in blogs and the use of similar tools, students are practicing writing more and regarding it less as work (Brown, 2007). The language arts content area is a natural fit for technology, especially with collaborative projects, multimedia presentations and other problem based learning assignments.

As our society continues to place greater emphasis on technology, both as an educational /reference and communications tool, effective integration of technology into the curriculum becomes even more important. The first step, in gauging how technology and in what ways it has been integrated to date, is to perform an analysis on how technology is being used. Once a benchmark is established, then a plan of action and policies can be designed on how to improve, Seton Hall pre-service teacher technology education.

As the literature clearly shows availability of technologies, especially in the areas of computers and internet access have grown within our schools. Effective modeling and course work showcasing what can be created using technologies such as PowerPoint, word, excel and various multimedia tools will serve to give pre-service teachers a full tool box of skills. The goal should be, as these pre-service teachers enter the profession is nurture and provided continued encouragement for them to use these acquired skills.

This overview of the current literature regarding the use of technology by pre-service teachers in their student teaching experience has provided a stepping off point to the research design and methodology of this study. The information presented in Chapter III will provide details to the research problem, questions and data collection techniques and analysis used in this study.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

The purpose of this study is to examine attending an electronic technology rich preparation program and the relationship between teaching styles of prospective teachers. Seton Hall University is a recognized leader in the use of technology for teaching and learning. Students in the pre-service education program are provided with individual laptops, loaded with the latest Microsoft Applications available, to use throughout their entire academic career. Professors within the program are encouraged to model practice-based, technology-infused lectures and teachings. The researcher gathered data by distributing an electronic survey which asked about teacher use of technology, from participants from one preparation program.

Research Questions

The researcher used three main research questions to guide this study:

1. What ways teachers are currently using technology,
2. How are teachers in this study using technology tools in their planning of learning experience.
3. How teacher's attitudes, understandings and skills related to technology use change over time?

The survey began with a straight forward question seeking to know how respondents are using electronic technologies such as computers or online tools. Respondents had sub areas to select from ranging from using technology to make handouts to exchanging computer files with other teachers. The exchanging of computer files with colleagues can serve as an indicator as to the amount of collaboration and idea sharing is taking place between teachers.

Two questions focused upon the respondents overall knowledge of basic computer operation and file management. Choices under basic computer operation ranged from the ability to run specific preloaded programs to having the ability to learn new programs on their own and then transfer that knowledge to their students. In the area of file management respondents were asked if they could perform such simple tasks as opening and saving documents on different drives such as flash, hard drive and content management systems. They were also asked if they could move files between folders and drives, and how often they use network drives.

A series of questions were used to measure respondents' ability to use specific software applications or tools. These applications included word processing, spreadsheet, database, graphics, internet, and e-mail. Specific questions also measured skill levels with imaging devices such as scanners, digital and video cameras.

At Seton Hall University, ethical use of technology is woven into the fabric of every technology course taken as an undergraduate. Therefore a question regarding the ethical use and understanding of technology based issues was included in the survey instrument. Four selections were possible ranging from one not being aware of any ethical issues regarding technology use to being able to model and teach good ethical usage of electronic technologies.

A major area covered by the survey was concerned with the respondents' ability to use technology in their subject areas. Questions measured ones' presentation skills, technology values and advantages, frequency of integration, and personal beliefs of the benefits of using technology. These questions were not multi-selection, but instead forced respondents to make the selection that best matched their true values towards technology.

The final area covered by the survey was designed to collect respondent demographical data such as area of certification, and technology based courses taken at Seton Hall.

Respondents were also asked specific questions regarding as to how they felt Seton Hall had prepared them in the use of technology, and how would they have described their technology skill level prior to entering the university.

Anonymity of the respondents was maintained by not requiring a target specific password to respond to the electronic survey instrument. Introductory e-mails and follow-up emails were delivered in a mass mailing list thereby eliminating the necessity for any other indentifying information.

Population and Sample

The population for this study was Seton Hall University senior secondary, elementary, and special education student majors who were completing their 15 week clinical practice (student teaching) experience. As a university, Seton Hall is dedicated to providing all of its students with the latest in technological tools as witnessed in its mission statement in which Seton Hall University states that its "students are challenged by outstanding faculty, an evolving technologically advanced setting and values-centered curricula." The College of Education seeks to prepare technology-proficient classroom teachers who can develop pedagogically sound plans for integrating technology into their classroom environments, and it requires its pre-service students to take at least one technology based course by their senior year. All Seton Hall students are provided with a laptop in their freshman year, with continued software updates provided throughout their collegiate career. Seton Hall University also uses a web-content delivered application (Blackboard) to provide students with online course information, requirements, and data. Therefore, the selection of Seton Hall senior student teachers was natural as research subjects. Subjects consisted of both male and female, and names were obtained from the Seton Hall College of Education and Human Services Office of Field Placement. This population was composed of 88 senior student teachers with ages ranging from 21 – 25 years of

age, with a gender mix of both male and female. The participant was informed about the study via electronic mail and consent was witnessed by their clicking on the link to begin the survey.

Sample size is a limitation. The research sample for this study is student teachers enrolled at Seton Hall University. Another limitation is response rate of surveys. Participants were not required to complete the survey, but were encouraged to do so by letting participants know how important their feedback is to Seton Hall's teacher preparation program. Participants had a week to complete the survey, and the time needed to take the survey was approximately 20 minutes.

Instrument Design

The researcher designed the survey tool after completing an extensive review of literature on the current trends in technology integration into curriculum. Three test instruments, Predicting Pre-service Teacher Competence in Computer Technology (Fleming, Motamedi & May, 2007), Teaching, Learning and Computing: 1998 Survey (TLC) (Becker & Anderson, 1998) and the Technology Implementation Questionnaire (TIQ) (Abrami, Wozney & Venkatesh, 2006) were used to develop the survey. Several questions specific to Seton Hall University were included in the survey instrument also.

The ultimate goal of survey research is to allow researchers to generalize about a large population by studying only a small portion of that population. Surveys frequently include questions designed to elicit descriptive information about a respondent such as age, education, and ethnicity. (Rea & Parker, 2005)

The survey is the most widely used technique in the social sciences because it has the advantage of reaching a large sample in a timely and economical manner (Newman & McNeil, 1998). Surveys are amenable to quantification and can be delivered with ease via electronic mail and with computerized statistical analysis.

The instrument was comprised of 38 questions that gathered information from participants in four areas: perceptions of one's self technology skills, instructor and cooperating teacher's use of technology, specific information regarding previous technology courses taken as a student at Seton Hall, and standard demographical information.

There were four subset areas which focused upon specific areas of technology utilization such as subject specialization and the accessibility of technology tools in both the classroom and resource lab. Another subset explored in the survey is the relationship of teacher technology. A key area focused upon in the subset is the effect if any of internet accessibility in the classroom. Many questions were multi-choice in design. This enabled the respondent to make selections for each question that truly matched their own technology understanding and competence.

Survey data was designed to have two distinct measurement properties, labeled categories (nominal scale) and how much the variables differ (interval scale). Questions seeking the response of: Do not use, Occasionally, Weekly, Quite often, were measured on the interval scale. Questions such as: How many hours do you spend on average each week using a computer, were designed to measure responses on a nominal scale.

A well designed survey has two qualities that need to be addressed throughout: the reliability of the tool and it validity. Reliability of questions occurs when the responses are consistent, and the validity is measured by whether the question indeed measures the concept of the study. Validity is based on content or face validity after review by a (a) jury of experts (faculty associated or with a knowledge base of both technology and pre-service education), and (b) a survey pilot group of 17 junior and senior education majors who were taking the course Integrating Curriculum and Technology during the spring 2008 semester. The piloting process yielded many comments regarding the usability of the tool especially in the area of length and

the complexity of the questions. As a result the researcher combined several questions, eliminated others and revised several to improve the continuity and quality of the instrument. This piloting process resulted in a 38 question survey instrument which was divided into three sections which each section measuring research and subsidiary questions see (Table 1).

Table 1:

Sample Survey Questions

Research Question 1 In what ways are teachers currently using technology?
• Section A - Please judge your level of achievement in each of the following competencies. Check the box or boxes that best reflect your current level of skill attainment. This section is designed to help understand your current level of skill with computer technologies. • Sample question for research question one: Database Use - Access ☐ *I do not use a database.* ☐ *I understand the use of a database and can locate information from a pre-made database.* ☐ *I can create my own database and define the fields and choose a layout to organize information.* ☐ *I am able to teach students to create and use databases to organize and analyze data.*
Research Question 2 In what ways do teachers in this study use of technology tools in the planning of learning experiences
• Section B - Please check the box or boxes of the response(s) that best answers the question. This section is to help the researcher understand your technology usage background both personally and in your own educational experiences. • Sample question for research question two: In your current educational setting do you have access to technology tools such as computers, projectors, smart boards, scanners and digital video or still cameras? ☐ *Yes, in my classroom environment.* ☐ *Yes, some in my classroom, but most tools are in a technology resource room environmer* ☐ *No, my school only has a technology resource room.* ☐ *No, my school has no technology, so if I want to use it in my teaching I have to bring in m own tools.* ☐ *Other, please specify:*

- Research Question 3
  How do teachers attitudes, understandings, and skill related to technology use change over time?

- Section B - Please check the box or boxes of the response(s) that best answers the question. This section is to help the researcher understand your technology usage background both personally and in your own educational experiences.

- Sample question for research question three:
  How often do you integrate electronic technologies into your teaching activities?
  - *Not at all*
  - *Rarely*
  - *Occasionally*
  - *Frequently*
  - *Almost Always*
  - *All the Time*

Data Analysis

The learning/adoption trajectory (Sherry et al., 2000) model served as the central theoretical structure in the analysis of the data in the study. The intent of this study was to collect data how Seton Hall University senior student teachers and graduates of the program used electronic technology for instructional purposes and what factors influenced their use of technology. The senior student teachers' ability to successfully mesh pedagogy and content with technology to make real-work educational connections to what is being learned should always be the driving force behind the integration of technology into the curriculum. A variable-oriented analysis was conducted with the criterion variable for this study being how much and in what ways teachers are using technology (Gay, 2006). Survey questions were designed using various measuring tools such as an affective test as an assessment to measure individual characteristics; and attitude scales (Likert, Semantic Differential and Rating).

The focus of the analysis was the interrelations among the criterion variable and the respondents surveyed. The quantitative data analysis included both univariate and bivariate analysis techniques. The bivariate analysis was especially useful in the comparison of different survey subcategories.

The completed surveys were accessed by the researcher by using the Asset Survey tool and the data was reviewed for statistical interests, comparisons, similarities, and trends; specifically as to how often electronic technology tools were used, teacher comfort levels and frequency or trends in using such tools. Additional data summaries were completed with restrictions applied for specific majors such as Elementary Education, Secondary Education, Special Education, Secondary Education English and Secondary Education Social Studies. These restrictions were applied to see if there were differences in survey questions responses by specific education majors. Particular areas of interest include the use of specific software applications and how electronic technologies were being used teaching lessons or classes.

CHAPTER IV

RESEARCH FINDINGS

The purpose of this study was to determine the effect of attending a technology rich program on the teaching styles of senior student teachers. It specifically examined how student teachers, in their senior year of college, have integrated technology into lessons and curriculum and their comfort level when using various forms of software and hardware that is available in the classroom. By indentifying the concerns and road blocks which are hindering full technology implementation, strategies can be recommended for enhanced the technology preparation for future program stakeholders.

Quantative measures were used in this dissertation to gather data that captures the attitudes, skill and comfort levels of senior student teachers in regards to technology. The following primary research questions were investigated:

1. In what ways are student teachers currently using technology?
2. In what ways do student teachers in this study use technology tools in the planning of learning experiences?
3. How do student teachers' attitudes, understandings, and skills related to technology use change over time?

Three subsidiary questions were investigated:

1. How has teacher subject specialization influenced technology integration?
2. What is the relationship of teacher training with technology tools have on technology integration?
3. How can access to technology tools (both in classroom and resource labs) influence technology integration?

The instrument selected to measure level of impact of attending an electronic technology rich program on the teaching styles of Seton Hall University senior student teachers was a survey entitled, Electronic Technology Integration into the Curriculum Survey prepared by the researcher (see Appendix A). This chapter will present the findings of the questionnaire responses as they connect to the study's primary research questions.

Analysis of Questions

Research Question 1

In what ways are senior student teachers currently using technology?

Questions 1 through 16 were designed to solicit data as to what ways student teachers are using technology. Question 1 asked in which way they were using electronic technologies (see Appendix A). Thirty four and nine-tenth percent stated that they occasionally use technology to record or calculate student grades, while 21.7% stated that they use it weekly, and 17.4% stated quite often (daily or every other day). When it came to creating handouts with technology, 73.9% stated that technology is used quite often (daily or every other day), and no one responded that they did not use technology. Responses to question 1 revealed that 87% of respondents used e-mail or some type of electronic technology to correspond with parents, and 21.7%o of respondents selected "quite often."

When it came to using electronic technologies to write lesson plans or retrieve information or pictures information from the internet for use in lesson plans, 78.3% responded "quite often" and no one responded that they "don't use" technology. Interestingly only 13% of the respondents stated that they either "weekly" or "quite often" used the World Wide Web or Course Management Software such as Moodle to post student work/assignments or resources.

When asked if they used camcorders, digital cameras or scanners, 56.5% responded "occasionally," while 17.4% responded "quite often." When asked about the exchanging computer/data files with other teachers, 82.6% responded either "occasionally" (52.2%) or "weekly" (30.4%).

Question 2 sought to identify comfort levels of respondents with basic computer operation. This question was multi-choice. Responses provided the researcher with expected results such as 100% of the respondents stating that they could run two programs simultaneously while having several windows open at the same time. When asked if they could learn new programs on their own and teach those applications to their students, 91.3% stated that they could.

Question 3 was concerned with file management of data on the computer, and 100% responded that they were able to create, organize, and back-up their files. Just 91.3% stated that they knew how to select, open, and save documents on to different drives such as flash, hard, content management systems, and portable hard drives. In response to the question whether they "have the ability to move files between folders, drives and content management systems" just 82.6% stated that they were able to do so. When asked if they knew how to teach their students to save and organize their files, 95.7% said that they could.

Question 4 dealt with word processing (WP). Eighty seven percent of the respondents stated that they used WP for nearly all their written professional work, and 69.6% indicated that they were able to teach their students how to use WP for the preparation of papers and other forms of written communication. Twenty six and one-tenth percent of the respondents stated that even though they knew how to use WP for simple documents, they found it easier to hand write most of their work.

Question 5 explored comfort levels and usage of spreadsheet programs such as Excel. When it came to understanding simple spreadsheets and how to create them, 87% stated that they could, while 60.9% said that they use complex spreadsheet functions such a formulas, cell referencing and creating useful charts. Even though 87% understood and knew how to create simple spreadsheets, only 43.5% stated that they are able to teach their students how to use such software to improve their own data and analysis skills.

When it came to spreadsheets usage by elementary education majors, 61.1% said that they use spreadsheet software for a variety of record keeping tasks and use such specific items as labels, formulas, cell references, and charts to represent their ideas. Only 50 % of secondary education majors said they could do the same. Asked if they were able to teach their students to use spreadsheet software, 44.4% of elementary education majors said they could, while just 25% of secondary education majors said they could teach their students how to use the software.

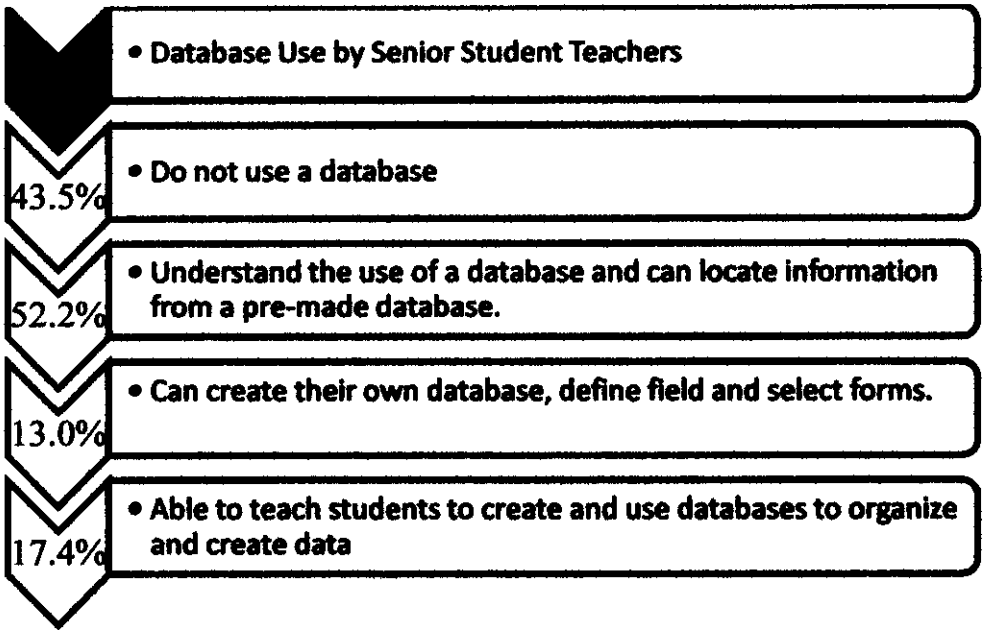

Figure 1 Database use.

Database use such as the program Access, was asked about in question 6, and 43.5% responded that they "do not use" a database, while 52.2 percent stated that they "understand"

databases and are able to locate information from a pre-designed one (figure 1). Only 13% responded that they "are able" to create their own database from scratch, while just 17.4% "are able" to teach their students how to create, use and organize a database.

When it came to database use by elementary education majors, 50.0% said that they use database software and are able to locate information on a premade database, while 75% of secondary education majors said they were able to do the same. When asked if they were able to create their own database from scratch, 16.7% of elementary education majors said they could, while no secondary education majors replied that they could do so. Asked if they were able to teach their students to use spreadsheet software, 22.2% of elementary education majors said they could, while no secondary education majors said they could teach their students how to use the software.

Question 7 was concerned with graphics, and responses clearly showed a strong confidence level with 82.6% stating they "are able" to promote student interpretation and display of images using a variety of tools and programs. When it came to being able to open, create, and place pictures into documents using drawing programs or clipart 100% of the respondents stated that they were able to do so, while 87% stated they "are able" to create their own graphics for the purpose of enhancing or amplifying the message or lesson.

Question 8 sought information about internet use, while question 9 looked for data concerning e-mail usage. Every respondent used the internet in some way or form, while 95.7% stated that they "are able" to use it for the creation of electronic resources, bookmarks/favorite, and knew how to use search engines to fine reliable educational resources. When it came to teaching their own students how to find and cite reliable internet sources, 87% responded that they "are able" to do so. Asked if they used e-mail on a regular basis, 95.7% responded that

they did, while 91.3% stated that they incorporate e-mail use into classroom activities and "are able" to involve their students in communication with both other students and experts in subject matter from other states or nations.

Question 10 sought data on the use of imaging devices such as scanners, digital, and video cameras. When it came to being able to use such devices, 91.3% stated that they could, while only 78.3% stated that they were able to integrate material created in such devices into other software programs or documents. Asked if they could teach others how to use such devices and integrate that material into other software programs or documents only 56.5% stated that they could do so, a difference of 21.8% between being able to use and being able to teach.

The ethical use and understanding its meaning associated with using electronic technologies was addressed in question 11. Ninety five and seventh-tenth percent of respondents stated that they knew that copyright restrictions might apply to computer software and downloaded materials, but only 69.6% were able to understand district rules concerning technology with either e-mail or the use of copyrighted materials. Only 65.2% of respondents stated they "are able" to model good ethical usage of electronic technologies. A difference of 30.5% between knowing that copyright restrictions may apply and being able to model good ethical usage of electronic technologies.

The use of digital video production and presentation skills with software such was PowerPoint was addressed in questions 12 and 13 respectively. When it came to being able to create original digital videos for home or school projects, 60.9% stated they "are able" to do so, while just 34.8% "are able" to electronically edit original videos using such standard applications as Windows Movie Maker, iMovie, or Adobe Premier Elements. Only 21.7% of the respondents stated that they had the ability to teach students how to create and edit digital videos.

The use of presentational skills with software such as PowerPoint provided no surprises to the researcher, as 100% of the respondents stated that they were able to present and teach a class unitizing presentation software tools. They also felt that they could use various multimedia elements such as sound, video, and graphics. The ability to teach their students how to use presentation software was firmly held by 82.6% of the respondents, while only 73.9% stated that they "are able" to facilitate student use of presentation software to persuasively present their research or problem.

Question 14 sought responses regarding the setting in which respondents first became comfortable with using electronic technologies, both hardware and software, and 95.7% responded that it was in high school or earlier. Seventeen and four-tenth percent stated that is was during their undergraduate years at Seton Hall, and 4.3% stated that they achieved a comfort level during their student teaching experience.

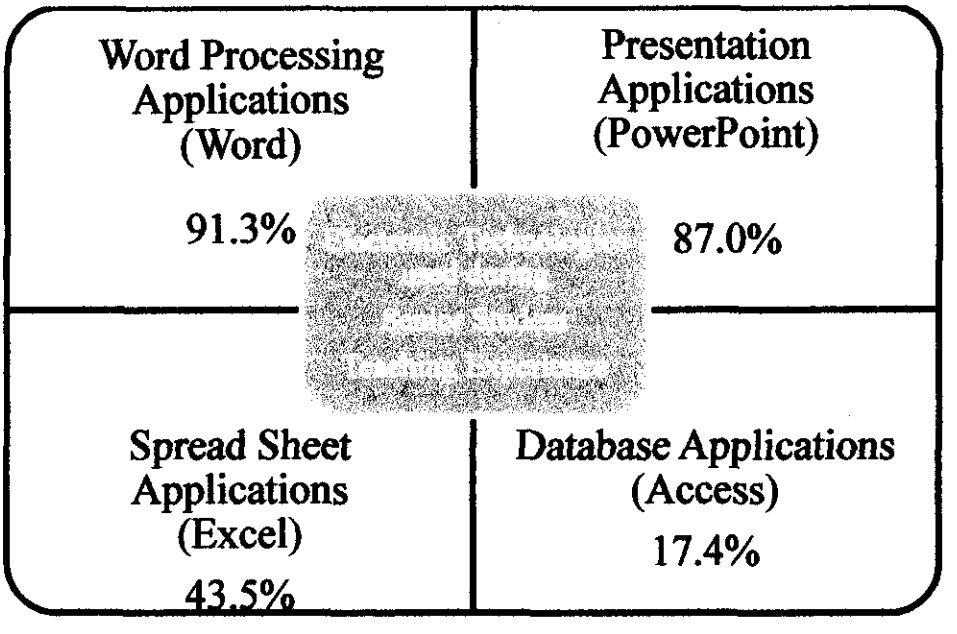

Figure 2 Electronic technologies used.

Question 15 asked if they used computers during student teaching, which 100% stated yes, and question 16 asked how/what technologies were used: 91.3% used word processing, 87%

used presentation software, 43.5% used spreadsheet software, 17.4% used database software, 87% used graphic software, 91.3% used the internet, 87% used e-mail, and 21.7% stated they used all listed software (figure 2).

Research Question 2

In what ways do senior student teachers use technology tools in the planning of learning experiences?

The responses from questions 17 through 21 pertained to research question 2, which were designed to solicit data as to what ways Seton Hall senior student teachers are using technology. Question 17 specifically asked how valuable respondents thought electronic technology software or hardware was to their teaching. Responses were made from the following choices: not needed, some value, valuable, essential, missing. When asked if six computer workstations with internet access were valuable, 87% selected valuable and 8.7% selected essential. When it came to having a teacher's computer workstation with e-mail access, 47.5% selected valuable while 47.8% said it was essential. The availability of scanners and digital cameras brought some interesting responses, as just 56.5% responded valuable when it came to scanners, and slightly higher valuable response rate for digital video cameras with 60.9%. Only one respondent (4.3%) stated that having a digital video camera was essential to their teaching.

The ability to have access to projectors to show both teacher and student PowerPoint presentations was seen as valuable or essential to 95.7% respondents, while having Smartboard access was seen valuable by 73.8%. Access to electronic encyclopedias and educational software such as Inspiration/Kidspiration, Timeliner, and reference software tools was seen valuable to 65.2% of respondents and essential to 26.1% of respondents.

Question 18 asked about the advantages of using technologies such as computers and digital tools in teaching. When asked if their students create better-looking products when using electronic technologies 62.2% responded affirmatively. The response to the question of student's writing quality is stronger when they use word processing tools provided interesting results; as 39.1% agreed with the statement, while 39.1% disagreed, and 21.7% were not sure. Almost the exact same response occurred when asked if students using electronic technologies, such as computers, work harder at their assignments; 34.8% agreed, 34.8% disagreed, and 30.4% were unsure. The question regarding the use of electronic technologies to enable "average" student to produce work and communicate in ways only "gifted" students did in the past produced interesting data; 47.8% of the respondents agreed, while 30.4% disagreed and 21.7% were not sure.

Question 19 was designed to solicit data as to how frequently electronic technologies were integrated into respondents teaching activities. Instructional "drill and practice" software was selected as either never or practically never by 60.8%, while 26.1% said that they fairly often used such software. The use of an LCD projector and Smartboards was used by 21.7% on a fairly often basis, 34.8% very often and 39.1% responded almost always for a total of 95.6%. Using creative types of software such as desktop publishing applications, and video of photo editing applications were selected as practically never used by 39.1% and fairly often by 47.8% of the respondents.

Questions 17, 18, and 19 all served a dual propose, providing answers to the subsidiary question of how does the accessibility of electronic technology tools both in the classroom and resource labs influence electronic technology integration. With 87.0% (20) of the respondents saying that it would be valuable to have at least six computer workstations with internet access in

their classroom and 95.7% (22) responding that have access to a LCD or PowerPoint projector was either valuable or essential to their classroom teaching. When asked if how they felt about having a smartboard in their classroom 87% (20) responded that it was either valuable or essential to their teaching. The researcher found this quite interesting as only one smartboard currently exists in the College of Education, and has been mostly used only by students taking EDST 3700, which is only required by secondary education majors.

The use of expressive types of software such as MS Word was reported almost always used by 39.1%, while 26.1% replied very often and 30.4% selected fairly often. Using evaluative software such as online testing, assignments, and student portfolios was "practically never" used by 52.2% of respondents, while 17.4% stated that they "never use" these types of applications. The use of informative technologies such as the internet was used almost always by 47.8% of the respondents and very often by 21.7%.

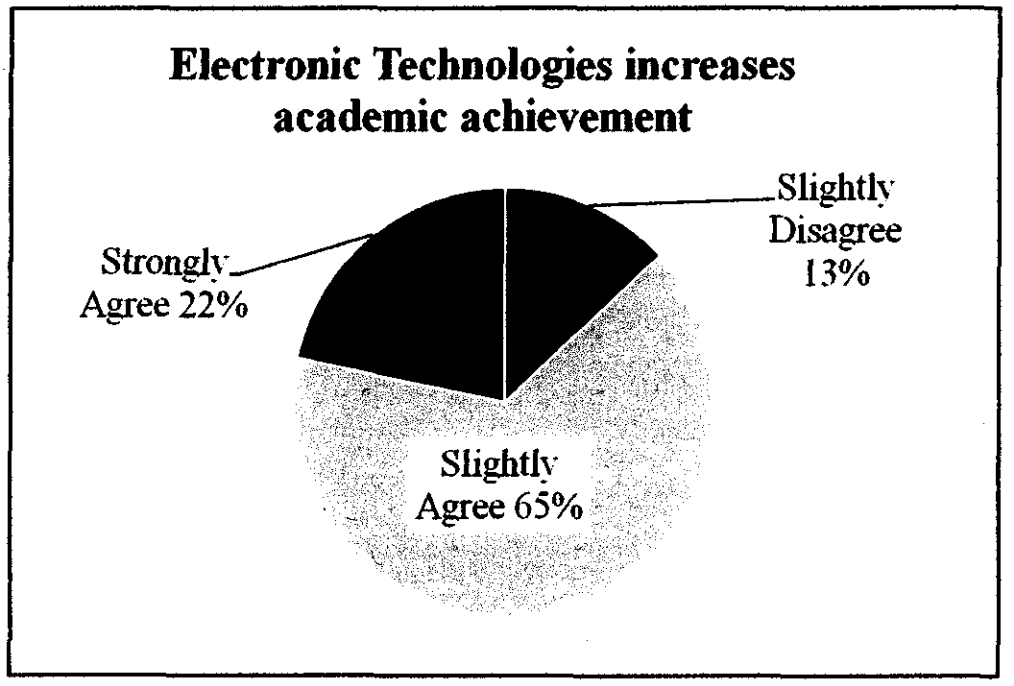

Figure 3 Academic achievement.

Question 20 measured the extent (agree or disagree) with various statements regarding the use of electronic technologies in the classroom. The use of electronic technologies as a factor in the increasing of academic achievement was seen as slightly agreed to by 65.2% and strongly agreed to by 21.7% of the respondents, while 13.0% disagreed with the statement (figure 3). Seventy of respondents strongly agreed with the statement that electronic technology is a valuable instructional tool, while 26.1% slightly agreed. One hundred percent either slightly agreed or strongly agreed with the statement that electronic gives teachers the opportunity to be learning facilitators rather than learning providers. Sixty five and two-tenths percent of respondents strongly agreed with the statement that electronic technologies are effective tools for students of all abilities, and 60.9% strongly agreed that electronic technologies enhances their own professional development.

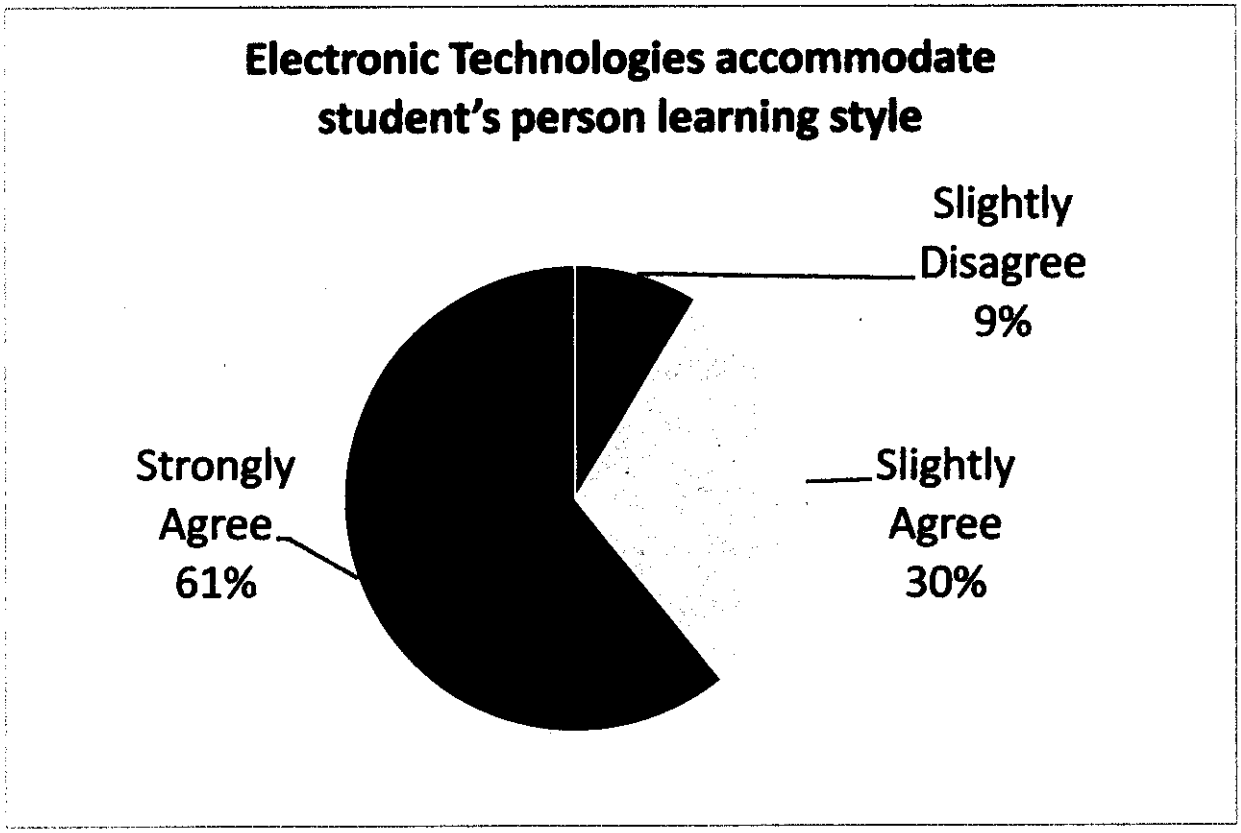

Figure 4 Personal learning styles.

When asked if electronic technologies can help accommodate students' personal learning styles 60.9% responded that they strongly agreed and 30.4% stated that they slightly agreed, and 9 percent slightly disagreed (figure 4). 60.9% strongly agreed that electronic technologies were motivating factors for students to get more involved in learning activities, while 39.1% slightly agreed. Four statements in question 20 were specifically designed to collect data regarding teachers' individual use of electronic technologies when planning, and integrating electronic technology usage.

When asked if the use of electronic technologies limits their choices of instructional materials 56.5% strongly disagreed, and 26.1% slightly disagreed. A unique split was revealed

when asked is electronic technologies were effective only when extensive computer resources were available: 21.7% strongly disagreed, 43.5% slightly disagreed, 30.4% slightly agreed, and 4.3% strongly agreed. The need for extra time to plan learning activities when using electronic technologies saw 34.8% or respondents slightly disagreeing, while 39.1% slightly agreed and 21.7% strongly agreed that using electronic technologies take extra planning time. When asked if using electronic technologies improves student learning of critical concepts and ideas; 65.2% slightly agreed and 26.1% strongly agreed, while 8.7% slightly disagreed.

Question 21 specifically asked about access to electronic technologies in their current educational setting. The technologies addressed were: computers, projectors, smartboards, scanners, digital video and still cameras. Fifty two and two-tenths percent stated that they did have access to some if not all of these devices in their classroom, while 39.1% responded that they have some of these devices in their classroom but most are found in the technology/media resource room. Four and three-tenths percent responded no that electronic technologies are only found in the resource room, while 4.3% responded no and their school does not have access to any electronic technologies.

Research Question 3

How do senior student teachers attitudes, understandings, and skill related to technology use change over time.

The responses from questions 22, 23, 24, 26, 27 and 28 pertained to research question 3 and were designed to solicit data as to what ways Seton Hall senior student teachers' attitudes, understandings, and skills related to technology use change over time. Question 22 asked how often respondents integrated electronic technologies into their teaching activities. Fifty six and five tenths responded frequently, 21.7% selected almost always and 8.7% stated all the time.

Questions 23 and 24 sought data on respondents' personal use of electronic technology tools while at Seton Hall, and what types of software applications they used. One hundred percent responded yes they had used electronic technologies and selected software applications used as word processing (87%), presentation (82.6%), spreadsheet (73.9%), database (39.1%,), graphic (87%), internet (87%), electronic mail (82.6%), and (47.8%) stated that they used all of the previously mentioned applications.

Questions 26, 27, and 28 measured how well Seton Hall prepared respondents to use electronic technologies and what level they thought their own technology skills were when entering the university. As for the skill level the respondents had upon entering Seton Hall University 47.8% rated their electronic skill level at average, while 52.2% felt that their skill level was above average. No one selected their entering skill level as either poor or outstanding.

When asked what Seton Hall could have done to improve their use of electronic technologies, 26.1% stated that two electronic technologies courses could have been required. Thirty and four-tenths percent suggested that additional electronic technology courses be offered as electives, while 60.9% felt that requiring them to take just one course was enough to prepare them for using electronic technology tools in their own professional teaching.

Question 28 solicited data on how well respondents felt they were prepared in the application of technology to instruction. Thirty four and eight-tenths percent stated that they were moderately prepared, while 65.2% answered that they were fully prepared. When broken down into elementary and secondary education majors, 38.9 % of elementary education majors felt that they were moderately prepared to use electronic technology and 61.1% said that they were fully prepared. Of the secondary education majors, 25% responded that they were moderately prepared, while 75 % were fully prepared to use technology in the classroom. The

researcher feels that secondary education majors may feel that they are better prepared to use electronic technologies based on the fact that they have not been exposed to all of the different options available to use in electronic technologies. This is based on the knowledge that elementary education majors are required to take a course in computer fundamentals which provides a solid overview of all of the software packages available to all education majors.

Demographic Questions

The responses from questions 25, 29, 30, 31, 32, 33 and 34 were designed as general demographic questions to provide the researcher with background information on respondents. Question 25 solicited data on the specific areas of teacher certification that respondents were qualified to teach. Seventy eight and three-tenths percent were Elementary Education, 8.7% were Secondary Education English, 8.7% were Secondary Education Mathematics, 4.3% were Secondary Education Science, 17.4% were Secondary Education Social Studies, with 69.6% seeking dual certification in Special Education.

The subsidiary question as to subject specialization was addressed in question 25, with 18 of the 23 respondents seeking to obtain their teaching certification in the area of Elementary Education, a common double certification area for elementary education majors is special education which was confirmed with 16 respondents stating that they were also earning their certification in that area.

When asked how many hours a week respondent's average on their computer, 69.6% stated 11 hours or more, while 30.4% selected 6 to 10 hours. Seventy two and seventh-tenths percent of respondents were student teaching in an elementary school, 4.5% were in a middle school, and 18.2% in a secondary school environment.

Questions 31 and 32 were designed to solicit specific responses as to what technology base courses offered by the Department of Education Studies within the College of Education at Seton Hall University were taken by respondents. Ninety one and three-tenths percent had taken BMIE 1001 Computer Fundamentals, which is a required course for all elementary education majors; 26.1% had taken BMIE 3700 Integrating Curriculum and Technology, which is a required course for secondary education majors and an elective for elementary education majors; and 4.3% had taken BMIE 4343 Computer Graphics as an elective course. There were a total of 6 respondents listed as secondary education majors, with 1 earning dual certification in the secondary subject areas of Math and Science.

Questions 27 and 28 addressed the subsidiary question of the relationship of teacher electronic technology training and its integration into the classroom environment. With 60.9% of the respondents (14) responding that the technology course they took was adequate in preparing them to use electronic technology, 26.1% (6) responded that two electronic technology based courses should have been required. It can be assumed that those 6 respondents were secondary education majors as they are currently the only education majors required to take two technology courses. The other course is BMIE 1001 Computer Fundamentals, which is usually taken in the students' freshman year, while EDST 3700 is traditionally taken by secondary education majors in their junior or senior year.

General demographic information was solicited in questions 33 and 34, and 91.3% of the respondents were female and 8.7% male. The racial/ethnic background of respondents was as follows: 4.3% Asian, 91.3% Caucasian, and 4.3% Hispanic. No African Americans participated in this study.

The data collected by the survey tool provided a valuable overview as to how the current electronic technology undergraduate teacher education program is working at Seton Hall. This data also provided some information as to what program shortcomings exist, what has been successful and what can be done to improve upon the current success of the program all of which will be presented in detail in Chapter V.

CHAPTER V

SUMMARY, DISCUSSION AND RECOMMENDATIONS

This chapter presents, in a linear style, the summary of this study, a review of the findings from the statistical analysis, conclusions based on the research questions presented in Chapter 1, and recommendations are offered as well as areas of future research. The purpose of this study was to determine the effect of attending a technology rich program on the teaching styles of senior student teachers at a mid-sized, private university in the northeast United States. Specifically, this study was designed to uncover trends and seek connections between senior student teachers attending Seton Hall University's technology rich pre-service training program and how those technology skills acquired were being utilized in their cumulating clinical practice experience.

An electronic Web-based survey instrument, developed using the Asset Survey Tool, was used during this study and was constructed after review of the research literature on current trends in technology integration into the curriculum. The survey was delivered electronically via a personalized e-mail available at Seton Hall University to senior student teachers during the spring 2008 semester. The key issue addressed was not whether senior student teachers from Seton Hall University use technology, but instead, what specific technologies are being used and in what particular way they are being applied.

Summary of the Study

Research Question 1

Research question 1 asked in what ways are senior student teachers currently using technologies? The teachers responded that electronic technologies were being used quite often to make handouts, calculate grades, correspond with parents, write lesson plans or subject related notes, and gather information from the internet for use in lessons. The highest response rate came with the use of creating lesson plans and gathering information from the internet, as 78.3 percent of the respondents stated that they did this quite often.

Senior student teachers felt strongly that they were able to grasp all facets of basic computer operation with 100 percent of the respondents stating that they could run two software programs simultaneously, and 91.3 percent responded that they could learn new software applications on their own and successfully teach such applications to their students. Senior student teachers answered that they were able to maintain electronic file management, which includes saving documents on various drives such as flash, portable hard drives and online content systems. They all felt that they could create folders and files, and organize and backup data files as needed. The researcher expected such a result, as education majors at Seton Hall are required to take BMIE 1001 Computer Fundamentals or EDST 3700 Integrating Curriculum and Technology in which file management and its importance are explained and modeled.

When it came to specific software applications being used by senior student teachers, word processing, spreadsheet, database, graphics, and the internet (World Wide Web) were all being used to a certain extent. Word processing was used being used by 87 percent for nearly all their written professional work, while 87 percent stated that they could understand and use spreadsheet software. Database software was only being used by 52.2 percent of respondents,

while 43.5 percent stated that they never use it. The ability to create graphics and include them into documents or presentations was being done by all respondents (100%), while 82.6 percent stated that they were able to use graphics to promote types of visual learning experiences. As expected the internet was used by all respondents in various forms, with 87 percent stating that they were able to teach their students how to effectively find reliable resources on the World Wide Web.

Electronic digital imaging devices such as scanners, cameras and video cameras was used by 91.3 percent of respondents, but dropped off to just 56.5 percent who felt that they could teach others how to use such devices and integrate that material in other programs. What is interesting is that 69 percent stated that they could create original digital videos for home or school, but only 34.8 percent were able to edit their videos using common software applications such as Windows Movie Maker (WMM), iMovie, or Premier Elements. Both WMM and Adobe Premier Elements come standard on the software image provided to all undergraduate students at Seton Hall University. This is an area that needs to be improved upon especially with the growing interest in digital storytelling and podcasting.

The issue of ethical use of electronic technologies, especially such issues as copyright restrictions, was understood by 95.7 percent of the respondents, while just 65.2 percent stated that they were able to model good ethical usage of electronic technologies. When it came to using electronic technologies such as a computer during their student teaching experience 100 percent responded that they had done so, with software applications such as word processing and presentation being the most used. The least used application during their student teaching experience was database software such as Access, which was to be expected due to the current

lack of database software exposure in the current educational technologies curriculum at Seton Hall.

Research Question 2

Research question 2 asked in what ways senior student teachers use technology tools in the planning of learning experiences. Eighty seven percent of the respondents felt that having six or more computer workstations in their classroom was valuable to the learning experience. The availability of a projector to present PowerPoints and other teacher created multimedia learning tools was seen as a valuable tool to both the planning and learning experience by 95 percent of respondents. This was expected as Seton Hall University has a long and rich history in technology usage in the classroom, which is coupled nicely with the availability of laptops to both students and faculty. Nearly all of the classrooms on the campus of Seton Hall have Proxima projectors installed which can easily be connected to both faculty and student laptops, in addition to wireless internet availability. The availability of Smartboards was seen as essential to 73.8% of survey respondents as they felt that their improved skill level in using such a technology tool was crucial in the classroom of today. Currently education majors within the teacher preparation program are only exposed to Smartboards in the Integrating Curriculum and Technology course. An ideal situation would be the availability of numerous Smartboards for use by all faculty within the program.

One of the most puzzling responses by respondents was to question 18 which addressed the advantage of using technologies such as computers and digital tools in teaching.
When asked if students created better-looking products with electronic technologies then they could with traditional media or techniques 65.2 percent agreed, while 17.4 percent either disagreed or were not sure. But, 95.7 percent felt that electronic technologies provide a break for

students from routine learning activities, and even more interesting was the fact that 78.3 percent responded that electronic technologies enable students to work cooperatively.

When asked if they thought the use of electronic technologies enabled the average student to produce artifacts in ways that only the gifted or honors students did in the past 47.8 percent agreed with the statement, while 30.4 percent disagreed, and 21.7 percent were unsure. This was not surprising with the survey respondents being in only their senior student teaching experience. It would be interesting to see how they felt 2 to 3 years into their professional career.

When asked specifically what types of technologies (specifically e-mail, Proxima Projectors and Smartboards) they use and how often they use them, 95.6 percent responded between fairly often and almost always. That is the same response rate when asked if they used expressive software applications such as MS Word. The use of desktop publishing applications such as Publisher or digital camera or graphic or photo editing applications was used fairly often by 47.8 percent of respondents while 39.1 percent selected practically never.

The question as to the extent of the use of electronic technologies in the classroom, and does such use give teachers the opportunity to be learning facilitators instead of information providers, was strongly agreed to by 52.2 percent of respondents and slightly agreed to by 47.8 percent for a combined 100 percent. Even more powerful was the fact that 65.2 percent of respondents strongly agreed with the statement that technology is an effective tool for students of all abilities, while 30.4 percent slightly agreed. Finally the most impressive statement was that 91.3 percent either slightly or strongly agreed as to technology helping accommodate student personal learning styles. It can be assumed that the infusion of technology both as stand-alone courses and with specific education core courses has played a major factor in these responses.

Research Question 3

Research question 3 asked, "How do senior student teachers attitudes, understandings, and skills related to technology use change over time." When asked how often electronic technology was integrated in their teaching activities, 56.5 percent responded "frequently," 21.7 percent selected "almost always" and 8.7 percent stated "all the time." All of the respondents felt that when they entered Seton Hall they were either average or above average when it came to their technology skill level. However, only 65.2 percent selected that they were fully prepared to teach with electronic technology as they entered their senior student teaching experience and 34.8 percent felt that they were only moderately prepared to do so.

When asked if they had ever taken an electronic technology course during their undergraduate career at Seton Hall, 91.3 percent selected yes. Out of the 10 electronic technology based courses offered at Seton Hall, 91.3 percent has taken the course Computer Fundamentals, while just 26.1 percent had taken Integrating Curriculum and Technology. These were the only two courses from the 10 course offering available taken by the survey respondents.

Currently the Seton Hall Elementary Education program requires its majors to take Computer Fundamentals and 78.3 percents of survey respondents were such majors. Secondary Education majors at Seton Hall are given the option of taking Integrating curriculum and Technology, and 17.4 percent responded that they had done so. The selection of technology courses and the amount to take is currently be revisited by both programs.

Conclusion and Recommendations

The purpose of this study was to examine the effect of attending a technology rich program on the teaching styles of Seton Hall University senior student teachers. Information was sought to see how responding senior student teachers had integrated technology and practiced it

in their curriculum and to what extent was it effective. Three research questions were designed to serve as the core of this study and based on the data collected the following conclusions and recommendations can be proposed.

The data gathered about the ways senior student teachers are using technology shows a willingness on the part of these student teachers to use electronic technologies, as a result of student participation in a technology rich teacher preparation program. Additional study could be completed with teachers from a non-technology rich teacher education program compared to a teacher education program that is not infused with electronic technologies. Senior student teachers who participated in the survey reported being comfortable with running multiple computers and software applications at the same time and all possessed a strong knowledge base of such basic software application as Word and PowerPoint.

In the area of being able to use specific electronic technology tools and software and applying such items for use within the classroom a noticeable gap was found. For example, over 50 percent of respondents felt that they understood how to use and locate information from a database software, while over 40 percent stated that they never used database software. The same gap appears when it comes to the use of spreadsheet software such as Excel, as over 80 percent responded that they can create simple spread sheets and charts. But when asked if they were able to teach their students how to use spreadsheet software the response was cut in half to just over 40 percent. MS Word was the software application which respondents reported being most comfortable with using during their senior student teaching experience, with PowerPoint being the second most comfortable. The two software applications least likely to be used by senior student teachers were spreadsheet applications such as Excel and database applications like Access.

Survey respondents, nearly 90 percent, articulated the value of having computer workstations in their classroom. The need to have access to a projector to show both teacher and student created PowerPoint presentations was seen as either valuable or essential to 96 percent of respondents, while 92 percent saw the need for teachers to have a computer in their classroom. This data clearly mirrors the learning environment created within the Department of Education Studies at Seton Hall, where professors and students are both encouraged to bring their laptops to class. Professors present new course information via PowerPoint's and students are often given assignments which are coupled with PowerPoint presentations.

The infusion of electronic technologies into lessons and curriculum by senior student teachers was quite strong but data show varied results as to how senior student teachers view the effect of such infusion. Nearly all agree that PowerPoint is an effective tool in lesson planning, content presentation, and student assignments. But when it comes to improving students writing quality only 39.1 percent agree that electronic technology can have any effect. This response may come directly from the fact that a majority of respondents were elementary education majors, and only 2 respondents were secondary education English majors. The high response from elementary education majors was to be expected due to the fact that all elementary education majors are required to take at least one course in electronic technologies, while secondary education majors are encouraged to take a course in electronic technologies if their schedule allows.

The use of technology was supported by 61.1 percent of all respondents, who stated that they were fully prepared to apply technology skills in the classroom. However even though such a high percentage was using technology, there is room for improvement amongst confidence level as nearly 38.9 percent felt that they were only moderately prepared to use technology tools

in the classroom instruction. On a positive note, no one stated that they were not prepared to use electronic technologies in their classroom instruction.

The data have provided the researcher with an overview of how senior student teachers are using electronic technologies in their classroom. In an effort to prepare tomorrow's teachers to effectively integrate technology into teaching practices; it is necessary for teacher preparation programs to facilitate positive attitudes toward technology (Bai, & Ertmer, 2008). Although the current curriculum format for undergraduate students within the Department of Education Studies program of the College of Education at Seton Hall University appears to be succeeding in preparing its students to use electronic technologies, there are areas that need to be restructured in order to secure continued student success.

With a majority of education students taking the Computer Fundamental course, it is only natural that a restructuring of software applications being taught within the course be undertaken. An important component of technical fluency is an understanding of how to use the technical tools of the discipline in ways that are consistent with the broader community of practice (Gomez, Sherin, Griesdron & Finn, 2008). Data supports that the course is doing an excellent job in preparing students to use applications such as Word and PowerPoint; but a stronger emphasis needs to be placed among the course time allotted for both spreadsheet programs such as Excel and database programs like Access.

Access or database software is the one application with a glaring weakness, as over 43 percent of respondents fail to use database software at all, and of the 52 percent who do only 13 percent can create their own database. Creating a database of any kind requires students to critically think from the very beginning. Maintaining that same database requires students to revisit those initial levels of thought and move to a higher plane of thought. Manipulating a

database requires students to basically "think outside the box" It enables students to reach higher levels of thinking as students: identify unique characteristics of the data; find qualities of the data to compare and contrast; and take that same data and rank the importance of that data for themselves (Using Computer Databases In The Classroom, 2007).

One recommendation for this course restructuring would be to include collaborative assignments, perhaps within the software applications of Word and PowerPoint, as data has shown that senior student teachers feel that electronic technologies enable students work cooperatively together. Collaborative projects would serve to show pre-service teaching candidates how technology can enrich lessons and projects. These projects will act to eliminate the isolation factor of working with technology described by Grabe and Grabe (2007) as only happening when teachers use technology as a tool for students to work on standalone projects. In particular technology collaboration can deepen (a) active student engagement, (b) participation in groups, (c) frequent interaction, and (d) feedback. The most crucial of the four aforementioned factors is feedback, which needs to be included in teacher reviewed student presentations of work, as well as along with peer reviews of student work. These two forms of feedback will serve to enhance a transfer of knowledge from student-to-student and not just instructor-to-student.

Another area that data showed needed revision was the way desktop publishing applications, which include digital camera/video or graphic photo editing applications, were being introduced in the current curriculum offerings. Today's students are third-stage technology users who continually are discovering and inventing new ways to use electronic technologies. These third-stage users according to Norton and Wilburg (2003) are able recognize the new uses and goals inherent in these electronic technologies and are learning to capitalize on

their possibilities. By increasing the availability of courses which place the emphasis of desktop publishing and multimedia applications the result will be senior student teachers who are prepared to teach and integrate such applications into their own classrooms.

This integration of such applications can be integrated into the current syllabi of any of the 10 technology based courses currently being offered at Seton Hall. The best fit for desktop publishing and multimedia applications would be in either of the Production Courses (I or II). In addition to serving as a best fit for the stated applications, both of the Production courses would also be solid courses to introduce, model, and instruct students on how to effectively use Smartboards in their teaching. The use of Smartboards is an important component of an understanding of how to use the technical tools of the discipline, which was a key point brought to light in the research presented by Gomez, Sherin, Griesdron and Finn (2008).

One of the successes of the current way pre-service teacher candidates are being taught technology within the Department of Education Studies at Seton Hall University is their marked comfort in using such applications at Word and PowerPoint. What needs to be improved is their comfort level at being able to teach their own students how to apply such technology skills to the learning process. This can be achieved, according to Malek (2008), by guiding the pre-service teacher candidates through meaningful practices, and by doing so they will become secure enough in their own skill level to able to teach their own students how to apply such skills while producing educational products.

The New Jersey Department of Education (2008) has outlined four distinct goals for its students to master regarding technology skills in the 21st century. They are as follows. Goal 1: All students will be prepared to excel in the community, work place and in our global society using 21st century skills. GOAL 2: All educators, including administrators, will attain the 21st

century skills and knowledge necessary to effectively integrate educational technology in order to enable students to achieve the goals of the core curriculum content standards and experience success in a global society. GOAL 3: Educational technology will be accessible by students, teachers and administrators and utilized for instructional and administrative purposes in all learning environments, including classrooms, library media centers, and other educational settings such as community centers and libraries. GOAL 4: New Jersey school districts will establish and maintain the technology infrastructure necessary for all students, administrators and staff to safely access digital information on demand and to communicate virtually. (Preparing Today, 2006). The Department of Education at Seton Hall and both the Elementary and Secondary Education programs has done well in preparing its pre-service teacher as to how to apply and use technology in the classroom. The State of New Jersey has issued the charge for increased knowledge of technology and application by future teachers, therefore continued course development must remain a part of both the Elementary and Secondary programs continued evaluation.

Recommendations for Future Research

Based on the findings and conclusion of this research additional areas of study are recommended:

Continued review by way of survey application the use of electronic technologies by senior student teachers. This can be completed either annually or on a semi-annually basis.

The research focused only on senior student teachers, but an electronic technology skill comfort level survey could also be given to pre-service teaching candidates at the beginning of their junior year. This might yield data that could serve as a baseline for assessing their electronic technology skill levels prior to their student teaching experience. Data gathered from

this survey would provide insight into what areas need to be improved in the technology based courses taken by education majors.

Research in the development of a technology software package (Word, PowerPoint, Excel, Access) skill assessment which can be given to students enrolled in BMIE 1001 Computer Fundamentals at the start of the course. Data provided from the assessment can be used by the instructor to customize course projects and assignments to help improve each student's technology skill level. The assessment can contain both theory based and hands on software tasks.

Emerging technologies and developmental theories available for use in the educational environment need to be researched tested and possibly integrated into Seton Hall's technology based courses on an annual basis.

Qualitative research through observations and focus groups accompanied by a quantitative research design would provide a more comprehensive analysis of the topic.

Concluding Remarks

The purpose of this study was to determine whether attending an electronic technology rich program has an impact on the teaching styles of Seton Hall University senior student teachers. This study aimed at gathering information through the use of an electronic survey tool which was delivered via electronic mail. It is clear from this research that senior student teachers have benefited from attending an electronic technology rich program. Even though the benefits far outweigh any negatives found in the current program, research has shown specific areas that need to be improved upon to ensure that pre-service teaching candidates within the program are provided with the depth of knowledge and skill level regarding electronic technologies needed develop into highly successful 21st century classroom teachers.

REFERENCES

Achilles, C. (1986). *Perspective on Change and Change Processes: Teaching/Learning as Viewed Through Communication Elements and Change Processes.* Unpublished Manuscript.

Achilles, C., Reynolds, J. Achilles, S. (1997). *Problem Analysis: Responding to School Complexity.* Larchmont, New York: Eye on Education

Babbie, E. (2001). *Practice of social research* . 9th Ed. Belmont, CA: Wadsworth Thomson

Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of Technology and Teacher Education,* 13(4), 519-546.

Becker, H.J., & Anderson, R.E. (1998). Teacher's survey: Combined versions 1-4. Retrieved February 14, 2008, from http://www.crito.uci.edu/tlc/html/questionnaires.html

Boleman & Deal (2003). Reframing Organizations: Artistry, Choice, and Leadership. San Francisco, CA: Jossey-Bass.

Brown, J. (2007, January). On Target, *The Journal*, 34, 19-24

CERN - Web Communications. (2008). *How the web began.* Retrieved January 18, 2009, from CERN: http://public.web.cern.ch/Public/en/About/WebStory-en.html

Dragula, P. (2005). *How to overcome technology integration barriers.* Retrieved from the World Wide Web December 3, 2006: http://www.techlearning.com/shared/printableArticle.jhtml?articleID=159901636

Fleming, L., Motamedi, V., & May. L. (2007). Predicting preservice teacher competence in computer technology: Modeling and application in training environments. *Journal of Technology and Teacher Education, 15*(2), 207-231. [Electronic Version] Retrieved February 1, 2008, from ProQuest Education Journals database. (Document ID: 1257716721).

Fulton, K., Glenn, A., & Valdez, G. (2003, December). *Three preservice programs preparing tomorrow's teachers to use technology: A study in partnerships.* Retrieved January 15, 2007, from Learning Point Associates: http://www.learningpt.org/pdfs/tech/preservice.pdf

Gay, L., Mills, G., & Airasian, P. (2006). *Educational research competencies for analysis and applications.* Upper Saddle River, NJ: Pearson.

Grabe M. & Grabe C. (2004) *Integrating technology for meaningful learning.* Boston: Houghton-Mifflin.

Grabe, M. & Grabe, C. (2007). *Integrating technology for meaningful learning.* (5 ed). Boston: Houghton-Mifflin.

Hawkins, J. (1997, July 1). *The world at your fingertips.* Retrieved October 13, 2007, from Edutopia: http://www.edutopia.org/world-your-fingertips

Jonassen, D., & Reeves, T. (1996). Learning with technology: Using computers as cognitive tools. In D. H. Jonassen (Ed.), *Handbook of research in educational communications and technology* (pp. 693-719). New York: Simon & Schuster Macmillan.

Jonassen, D. & Peck, K. & Wilson, B. (1999) *Learning to solve problems with technology: A constructivist approach.* Upper Saddle River, NJ: Merrill.

Kennedy-Kleyn, C. (2006). *Teachers and Technology – What's left?* Retrieved from the World Wide Web December 4, 2006: http://www.techlearning.com/shared/printableArticle-jhtml?articleID=193401850

Kirtman, L. (2002). *Policy and Practice: Restructuring Teachers' Work.* Education Policy Analysis Archives, Volume 10, Number 25. Retrieved from the World Wide Web November 8, 2002: http://epaa.asu.edu/epaa/v10n25/

Li, Y. & Achilles, C. (1999-2000) Four variables in teachers' integrating technology behaviors - A case study of a school in a Michigan school district. *Forum of Teacher Education Journal,* 10 (1), 12-21.

Maurer, M., Bell, E., Woods, E. & Allen, R. (2006) Structured Discover In Cane Travel: Constructivism in Action. Phi Delta Kappan December 2006. Retrieved from the World Wide Web December 18, 2006: http://www.pdkintl.org/kappan/k_v88/k0612mau.htm

Nanjappa A. & Grant, M (2003). *Constructing on Constructivism: The Role of Technology, Electronic Journal for the Integration of Technology in Education.* Retrieved from the World Wide Web November 29, 2006: http://ejite.isu.edu/Volume2No1/nanjappa.htm

Newman, I., & McNeil, K. A. (1998). *Conducting survey research in the social sciences.* Lanham, Md: University Press of America

Niederhauser, D.S., Lindstrom, D. L, & Strobel, J. (2007). Evidence of the NETS*S in K-12 Classrooms: Implications for Teacher Education. *Journal of Technology and Teacher Education, 15*(4), 483-512. Retrieved February 1, 2008, from ProQuest Education Journals database. (Document ID: 1412673531).

Norton, P., & Wiburg, K. (2003). *Teaching with technology.* Belmont, CA:

Wadsworth Publishing.

Prensky, M. (2006). *Adopt and adapt 21st-century schools need 21st-century technology.* Retrieved from the World Wide Web November 26, 2006: http://www.edutopia.org

Puma, M., Chaplin, D., & Pape, A. (2000). *E-Rate and the digital divide: A preliminary analysis from the integrated studies of educational technology.* Washington, D. C., U.S. Department of Education, Office of the Under Secretary, Planning and Evaluation Service.

Rea, L. M., & Parker, R. A. (1992). *Designing and conducting survey research: A comprehensive guide*. San Francisco: Jossey-Bass.

Richards, R. T. (1998). *Infusing technology and literacy into the undergraduate teacher education curriculum through the use of electronic portfolios.* T.H.E. Journal, 25 (9), 46-50.

Rogers, E.M. (1995). *Diffusion of innovation* (4th. Ed.) New York Free Press.

Russell, A. L. (1996). *Six stages in Learning New Technology.* Retrieved from the World Wide Web December 5, 2006: http://www.ascilite.org.au/asetarchives/confs/edtech90/russell.html

Sahin, I., & Thompson, A.. (2007). Analysis of Predictive Factors That Influence Faculty Members' Technology Adoption Level. *Journal of Technology and Teacher Education, 15*(2), 167-190. Retrieved February 1, 2008, from ProQuest Education Journals database. (Document ID: 1257716701).

Shelly, G., Cashman, T., Gunter, & R., Gunter, G. (2008). *Integrating technology and digital media in the classroom* (5th Ed.) Boston, MA: Thomson Course Technology

Sherry, L., Billig, S., Tavalin, F., Gibson, D., (2000). New insights on technology adoption in schools. *THE Journal.* Retrieved from the World Wide Web February 7, 2008: http://www.the journal.com/the/printarticle/?id=14594

Smerdon, B., Cronen, S., Lanahan, L., Anderson, J., Iannotti, N., & Angeles, J. (2000). *Computers and K-12 education: A different view.* Retrieved from the World Wide Web November 20, 2006: http://technologysource.org/article/computers_and_k12_education/

Solomon, G, (2004). *Drafting a Customized Tech Plan: An Up to the Minute Design.* Retrieved from the World Wide Wbe December 4, 2006: http://techlearning.com/shared/printableArticle.jhtml?articleID=17602669

Thorsen, C. (2006). *TechTactics, technology for teachers,* New York: Pearson.

Trilling, B. (2006). *Toward Learning Societies.* Redwood Shores, California: Oracle Education Foundation.

Witfelt, C. (2000). Educational multimedia and teachers' needs for new competencies to use educational multimedia. *Education Media International*, 37(4), 235-241.

Woodbridge, J. (2004). *Technology integration as a tranforming teaching strategy.* Retrieved from the World Wide Web February 4, 2008: http://www.iste.org/.../NavigationMenu/Research/NECC_Research_Paper_Archives/NECC_2004/Woodbridge-Jerry-NECC04.pdf

Woodbridge, J. (2002). *Defining a technology integrated curriculum.* Retrieved from the World Wide Web December 3, 2006: http://www.techlearning.com/db_area/archives/WCF/archives/jerwood.htm:jsessionid=RC

Wozney, L. Vivek, V. & Abrami, P. (2006). Implementing computer technologies: Teachers' perceptions and practices. *Journal of Technology and Teacher Education*; 14,(1;) ProQuest Education Journals, Retrieved from the World Wide Web February 2007.

Appendix A – Survey Tool

Electronic Technology Integration into the Curriculum Survey

This is not a test. There is no grade or other mark. There is no such thing as a right or a wrong answer. Read every question to make sure you understand it before giving your answer.

Section A - Please judge your level of achievement in each of the following competencies. Check the box or boxes that best reflect your current level of skill attainment. This section is designed to help understand your current level of skill with computer technologies.

1. In which of these ways do you use electronic technologies, such as computers, or online tools such as Moodle for teaching your classes or in other professional activities? I use electronic technologies to:

Record or calculate student grades...
Make handouts for students...
Correspond with parents...
Write lesson plans or related notes...
Get information or pictures from the Internet for use in lessons...
Use camcorders, digital cameras, or scanners to prepare for class...
Exchange computer files with other teachers...
Post student work, suggestions for resources, or ideas and opinions on the World Wide Web...

2. **Basic Computer Operation**
I can use the computer to run a few specific, pre- loaded programs.
I can run two programs simultaneously, and have several windows open at the same time.
I can troubleshoot successfully when basic problems with the computer printer occur.
I can learn new programs on my own and teach other applications to my students.

3. **File Management**
I can select, open, and save documents on different drives (Flash, Hard, Content Systems and Portable Hard Drives).
I can create my own folders to keep my files organized and often back-up my files.
I can move files between folders and drives, and often use my network content system to save data.
I can teach students how to save and organize their files.

4. **Word Processing**
I use a word processing program for simple documents, but I generally find it easier to hand write most work I do.
I use a word processing program for nearly all my written professional work: memos, tests, worksheets, and home communication. I can edit, spell-check, and change the format of a document.
I am able to teach students the use of word processing programs for preparing papers and other

written communication.

5. **Spreadsheet – Excel**

I do not use a spreadsheet software.

I understand the use of a spreadsheet and can create simple spreadsheets and charts.

I can use spreadsheet software for a variety of record-keeping tasks(electronic gradebooks). I can use labels, formulas, cell references, formatting tools, and can choose charts which best represent my data.

I am able to teach my students how to use spreadsheet software to improve their own data keeping and analysis skills.

6. **Database Use – Access**

I do not use a database.

I understand the use of a database and can locate information from a pre-made database.

I can create my own database and define the fields and choose a layout to organize information.

I am able to teach students to create and use databases to organize and analyze data.

7. **Graphics (Images) Use**

I do not use graphics in word processing or PowerPoint presentations.

I can open, create, and place simple pictures into documents using drawing programs or clipart.

I can edit and create graphics, placing them into documents in order to help clarify or amplify my message.

I am able to promote student interpretation and display visual images using a variety of tools and programs.

8. **Internet Use**

I do not use the Internet

I can access school and district Web sites to find information, and follow links from these sites to various Internet resources.

I can use lists of Internet Resources, create bookmarks/favorites, and make excellent use of Web search engines to explore educational resources.

I am able to contribute, by uploading information, to school or district Web sites.

I am able to teach students how to effectively find reliable resources on the Internet and correctly cite such information.

9. E-Mail Usage

I do not have an e-mail account.

I can send messages using e-mail - mostly to teaching colleagues, friends and family. I check my e-mail account on a regular basis and maintain my mail folders in an organized manner.

I can incorporate e-mail use into classroom activities.

I am able to involve my students in using e-mail to communicate with other students and experts from other states and nations.

10. **Imaging Devices**
I do not use imaging devices and software (scanners, digital cameras, video cameras).
I can use imaging devices such as scanners, digital cameras, and video cameras to create pictures and images.
I can use imaging devices and integrate that material into other programs or documents.
I can teach others how to use imaging devices and integrate that material into other programs or documents.

11. **Ethical Use and Understanding**

I am not aware of any ethical issues surrounding electronic technology use.
I know that some copyright restrictions apply to computer software and downloaded materials (MP3's, Video Tapes, DVDs).
I am able to understand district rules concerning student and adult use of e-mail and the Internet. I can understand and explain the school board policy on the use of copyrighted material.
I am able to model good ethical usage of electronic technologies, software and let students know my personal stand on this issue.

12. **Digital Video Production**
I do not use a digital video camera.
I can create original digital videos for home or school projects.
I can create original digital videos using computer video editing software such as Windows Movie Maker, imovie, or Adobe Premier Elements.
I am able to teach students how to create and edit digital videos.

13. **Presentation Skills**
I do not use computer presentation programs such as PowerPoint.
I am able to present my information and teach a class while using a presentation program such as PowerPoint, incorporating various multimedia elements such as sound, video clips and graphics.
I am able to teach students how to use presentation software such as PowerPoint.
I am able to facilitate students' use of a variety of presentation software such as PowerPoint to persuasively present their research concerning a problem or areas of focus in their learning.

Section B - Please check the box or boxes of the response(s) that best answers the question. This section is to help the researcher understand your technology usage background both personally and in your own educational experiences.

14. **In what setting did you first become comfortable with using electronic technologies such as computers, and software applications?**

While I was a student in high school or earlier
While I was an undergraduate at Seton Hall University
While working in another job, or while a student at another university
During my student teaching experience
During my first two years of teaching
I am still not comfortable with using electronic technologies

15. **Did you use a computer during your student teaching?**

Yes or Now

16. **If yes, how? (Check all that apply)**

Word Processing
Presentation
Spreadsheet
Database
Graphics
Internet
E-Mail
All of the above
Other, please specify:

17. **How valuable do you think the following equipment and software is or might be for your teaching.**

	Not needed	*Some value*	*Valuable*	*Essential*
At least six computer workstations with internet access in your classroom...	○	◉	○	○
Teacher's computer workstation with e-mail access...	○	○	○	○
A scanner for digitizing photos and graphics in you classroom...	○	○	○	○
At least one digital video camera for use in your	○	○	○	○

classroom...

Access to a projector to show both teacher and student made PowerPoint presentations...	○	○	○	○
A Smartboard in your classroom...	○	○	○	○
Access to electronic encyclopedias, educational software such as Inspiration and Timeliner, and reference works software...	○	○	○	○

18 . Which of the statements listed below are advantages of using technologies, such as computers and digital tools in teaching?

	Agree	*Disagree*	*Not Sure*
Students create better-looking products with electronic technologies than they could with just writing and traditional media...	○	○	○
Electronic technologies provide a welcome break for students from more routine learning activities...	○	○	○
Using electronic technologies enable students to work cooperatively together...	○	○	○
Students take more initiative outside of class time when using computers or other forms of electronic technologies...	○	○	○
Students' writing quality is stronger when they use word processing tools...	○	○	○
Students using electronic technologies such as computers work harder at their assignments...	○	○	○
Electronic technologies enable 'average' students to produce and communicate in ways only 'gifted' students did in the past...	○	○	○
Enables teachers to communicate with parents and fellow teachers in a timely manner...	○	○	○

19. **For each of the uses listed below please indicate how frequently electronic technologies are integrated into your teaching activities.**

	Never	*Practically never*	*Fairly often*	*Very often*	*Almost Always*
Instructional Software (e.g., drill & practice, tutorials, training)	○	○	○	○	○
Communicative (e.g., e-mail, LCD Projector, Smartboard)	○	○	○	○	○
Organizational (e.g.,data base, spreadsheets, lesson plans, record keeping)	○	○	○	○	○

Recreational Software (e.g., games)	○	○	○	○	○
Creative (e.g.,desktop publishing, digital video, digital camera, scanners, graphic/photoshop)	○	○	○	○	○
Expressive (e.g., word processing)	○	○	○	○	○
Evaluative (e.g., on-line testing, assignments, student portfolios)	○	○	○	○	○
Informative (e.g., Internet)	○	○	○	○	○

20. **Please indicate the extent to which you agree or disagree with the following statements regarding the use of electronic technology in the classroom.**

	Strongly Disagree	*Slightly Disagree*	*Slightly Agree*	*Strongly Agree*
Increases academic achievement (e.g. grades)	○	○	○	○
Is a valuable instructional tool.	○	○	○	○
Gives teachers the opportunity to be learning facilitators instead of information providers.	○	○	○	○
Is an effective tool for students of all abilities.	○	○	○	○
Enhances my professional development.	○	○	○	○
Helps accommodate students' personal learning styles.	○	○	○	○
Motivates students to get more involved in learning activities.	○	○	○	○
Limits my choices of instructional materials.	○	○	○	○
Is effective only when extensive computer resources are available.	○	○	○	○
Requires extra time to plan learning activities.	○	○	○	○
Improves student learning of critical concepts and ideas.	○	○	○	○

21. **In your current educational setting do you have access to technology tools such as computers, projectors, smartboards, scanners and digital video or still cameras?**

Yes, in my classroom environment.
Yes, some in my classroom, but most tools are in a technology resource room environment.
No, my school only has a technology resource room.
No, my school has no technology, so if I want to use it in my teaching I have to bring in my own tools.
Other, please specify.

22 . **How often do you integrate electronic technologies into your teaching activities?**

Not at all
Rarely
Occasionally
Frequently
Almost Always
All the Time

Section C - Please check on box that corresponds to the correct answer. This section is to help the researcher understand more about your background.

23. **While you were at Seton Hall University, did you use electronic technology tools such as a computer for completing any course assignments? Other than in your student teaching experience?**

Yes or No

24. If yes, how? (Check all that apply)

Word Processing
Presentation
Spreadsheet
Database
Graphics
Internet
E-Mail
All of the above
Other, please specify:

25. **Area of certification in education.**

Elementary Education
Music
Secondary Education - English
Secondary Education - Foreign Languages (Spanish, French, Italian)
Secondary Education - Mathematics
Secondary Education - Science Education
Secondary Education - Social Studies
Special Education
Other

26. **When you entered Seton Hall University how would you have described your technology skill level?**

Poor
Average
Above Average
Outstanding

27. **What could we have done at Seton Hall University to better prrepare you in the use of computer technology? (Check all that apply)**

Required two computer courses
Offered additional elective computer courses
The course I took was adequate
Other, please specify:

28. **How well are/were you prepared in the application of technology to classroom instruction?**

I am not prepared
I am moderately prepared
I am fully prepared

29. How many hours do you spend on average each week using a computer?

1 to 2 hours a week
3 to 5 hours a week
6 to 10 hours a week
11 or more hours a week

30. I am currently in my _____
Student Teaching Experience in Elementary Education.
Student Teaching Experience in Middle School Education.
Student Teaching Experience in Secondary Education.
Second Year of full-time teaching in Elementary School Setting.
Second Year of full-time teaching in a Middle School Setting.
Second Year of full-time teaching in a Secondary School Setting.

31. Have you ever taken any of the technology based courses offered within the Education Studies Department at Seton Hall?

Yes or No

32. If you answered yes to the previous question, please check the course(s) that you took.

BMIE 1001 - Computer Fundamentals
BMIE 3710 - Electronic Reseach Technologies
BMIE 3705 - Web Page Technologies
BMIE 3700 - Integrating Curriculum & Technology
BMIE 4343 - Computer Graphics
BMIE 3714 - Multimedia Technologies
BMIE 4304 - Production of Instructional Resources I
BMIE 4305 - Production of Instructional Resources II
BMIE 4344 - Social, Ethical and Legal Issues in Computing
BMIE 4345 - Online Course Management & Delivery
Other, Please Specify

33. Gender

Male or Female

34. Which of the following best describes your racial or ethnic background? Please check one.

Asian
Black/African American
White/Caucasian
Hispanic (may be any race)
Native American
Other, please specify: