Factors Affecting Counselor Educators' Integration of Educational Technology: A Path Analysis

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Factors Affecting Counselor Educators' Integration

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ABSTRACT

This study used path analysis to explore the effects of individual and institutional-level factors on counselor educators' integration of technology in counselor education. The study fills a gap in the literature by providing a research-based path model describing counselor educators' integration of technology in counselor education. Counselor educators' confidence and comfort using computers had the largest significant effect on technology integration in the counseling classroom. General school support for computer use significantly affected counselor educators' confidence and comfort levels in using computers. The effect of attitudes toward computer use on confidence and comfort using computers was the largest significant effect among the variables studied. Study findings provide important implications for counselor education programs, counselor educators, and technical support departments.

Keywords: counselor education, technology integration, path analysis

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CHAPTER I

INTRODUCTION

This study explored factors affecting counselor educators' integration of technology in counselor education. Previous studies have explored technology use in K-12 (Inan & Lowther, 2010; Matthews & Guarino, 2000; van Braak, Tondeur, & Valcke, 2004) and postsecondary settings (Meyer & Xu, 2009). Some studies have explored technological competence in counseling students (Berry, Srebalus, Cromer, & Takacs, 2003; Chandras, 2000; Edwards, Portman, & Bethea, 2002; Myers & Gibson, 1999); however, few studies have specifically explored the impact of factors affecting technological integration by counselor educators (Myers & Gibson, 1999; Sabella, Poynton, & Isaacs, 2010). No study was found that offered a proposed causal model regarding counselor educators' technology integration in the classroom. Proposed causal models (Inan & Lowther, 2010; Meyer & Xu, 2009) have been developed to describe the direct and indirect effects of individual educator-specific variables and institutional-level variables in secondary education. This study offered such a model for counselor educators.

Using a research-based path analysis model (Inan & Lowther, 2010; Matthews & Guarino, 2000; Meyer & Xu, 2009; van Braak et al., 2004), this study described the effects of counselor educators' intrinsic individual variables and extrinsic institutional variables on the integration of technology into the counselor education process.

Educator-specific variables in this study included age, years of teaching experience, preparation for computer use, attitudes toward computer use, and confidence and comfort using computers. Institutional variables in this study included general school-level support for computer use, technical support, and number of computers available in the classroom for instruction. The creation of a model describing individual-level and institutional-level influences on technology bridges a gap in the counseling education literature on technology integration. This research offered other contributions to the knowledge base regarding integration of technology in counselor education.

One contribution of this research was to validate the efforts of professional associations such as the Association for Counselor Education and Supervision (ACES) in encouraging inclusion of technology in counselor education. Application of the recommended intervention strategies proposed in this study could provide counselor educators with specific activities designed to change their teaching practices to incorporate educational technology successfully, thereby better equipping counselors with innovative ways to integrate technology in their work with clients. This study offers guidance for employers and administrators in educational institutions that can help predict counselor educators' likelihood of integrating technology in their teaching practices.

Statement of the Problem

Technology provides a driving force of change in society, and the pace of technological innovation is unlikely to lessen (K. Becker, 2010). Even though technology has become an integral part of everyday life (Lavin, Korte, & Davies, 2009), research as to how counselors and counselor educators adopt technology has not kept pace with the growth of technological innovation (Berry et al., 2003; Quinn, Hohenshil, & Fortune, 2002; Sabella et al., 2010). Counselor educators have the task of building counseling students' technological competence as evidenced by guidelines for online instruction (ACES, 1999a) and technical competencies for counselor education (ACES, 1999b, 2007) adopted by ACES. The paucity of research concerning how counseling students, counselors, and counselor educators use technology leaves many questions unanswered regarding how best to accomplish this task. Questions remain as to how counselors perceive the importance of becoming technologically competent, how often counselors and counseling educators adopt and implement important technological competencies, how counselors decide whether to use technology in their work with clients, and how counselor educators effectively integrate technology in the process of preparing counseling students (Myers & Gibson, 1999).

Further research regarding technology integration in counseling and counselor education could benefit all stakeholders. For example, clients might benefit from having counselors who are better equipped with current technology resources for finding career choices, searching for self-help resources on the Internet, or connecting the client with online support groups for grief or other issues. Counseling students could benefit from technologically competent instruction in their training programs. Counselor educators could benefit from greater technological competency as they educate and supervise counselor trainees, and finally, employers of counselor educators could benefit from information available to assist them in hiring technologically competent educators. Employers would also have more information to use in making decisions regarding realistic expectations of teaching load, preparation time, and compensation for educators who fully integrate technology into their teaching practices, both face-to-face and in the online classroom.

Purpose of the Study

The purpose of this study was to provide a proposed research-based path model that describes the direct and indirect effects of intrinsic educator-specific variables and extrinsic institutional-level variables (Inan & Lowther, 2010; Meyer & Xu, 2009) on counselor educators' integration of technology in the classroom. This research is important for transacting members of the counseling education process for several reasons. First, counselor educators have been given the responsibility of ensuring counseling students graduate with technological competency (ACES, 1999b). In order to carry out this responsibility, counselor educators need sufficient competency in learning and using technology in the classroom. Armed with technological competency, counselor educators then need to develop self-efficacy in integrating technology into their teaching practices. In other words, being technologically competent as a counselor educator does not mean that counselor educators can or will integrate technology into their teaching activities; and, this integration, or lack thereof, can have significant effects on the technological competence of counseling students. The study was designed to meet several expectations regarding integration of technology in teaching by counselor educators.

One expectation of this research was to offer professional associations within counselor education suggested strategies that could provide specific activities designed to change the teaching practices of counselor educators. Another expectation of the study was to assist those who teach technology to counselor educators, such as university centers for teaching and learning or technology support departments, by providing them with an increased understanding of individual factors affecting counselor educators' experiences with technology (Myers & Gibson, 1999). For example, understanding the effects of individual differences between computer users could increase the effectiveness of training programs for educators (Thatcher & Perrewé, 2002). Increased awareness of ways counselor educators learn and experience technology could result in measurable improvement in faculty acceptance and utilization of technology provided at the university level through more efficient application of financial and human resources. Compared to a course designed to develop skill in using a specific technology, a training course that addresses the broader focus of technology integration into teaching tends to improve teachers' self-efficacy (Abbitt & Klett, 2007). If counselor educators were to gain the ability to overcome intrinsic factors hampering their learning or adoption of technology, they might experience the freedom to explore creative applications of existing technologies in the classroom. Counselor educators might also find much needed energy to explore their pedagogical underpinnings through self-reflection on *how* they teach.

Counseling students could benefit from their instructors' technological competency. As counselor educators overcome internal obstacles to improving technological competence, they become better equipped to help students make the same transformative journey. As a result, students may make measurable gains in learning and using technology in counseling. Finally, this study fills a gap in the literature concerning counselor educators' technological competence. No study was found that considered both individual counselor educator factors and institutional-level factors using path analysis. Future research could build on the information gathered in this study about counselor educators' technology integration.

Review of Related Literature

This section presents selected findings from a review of the literature relating to factors affecting technology integration in counselor education. The review is organized into six major sections, beginning with an overview of technology and a brief history of the computer and the Internet. The second section of the review addresses technology in education, including its impact on students and educators and its integration into the classroom. The third major section covers technology in counselor education and its integration in the counseling training process. Information regarding individual factors that affect diffusion and adoption of educational technology is presented in the fourth section. The fifth section explores institutional-level factors affecting technology integration. The final section of the literature review examines assessment and measurement of technology integration.

Technology.

Technology continues to expand rapidly in nearly every context imaginable, and it has become an integral part of life for many (Bates & Poole, 2003; Lavin et al., 2009; Mitzner et al., 2010; Myers & Gibson, 1999). In fact, technology use seems mandatory in order to function in today's world (Mitzner et al., 2010). For example, the Internet has become a necessity for communications, travel, banking, entertainment, news, and education (Bates & Poole, 2003; Poynton, 2005). Although many may view technology as a way of life for younger individuals, people of all ages feel the impact of the technology revolution (Poynton, 2005). As technology increases the career life cycle for aging adults, older workers find themselves trying to stay abreast of newly emerging technology in the workplace in order to remain competitive (Mitzner et al., 2010). In the past, having skill in a specific area of work made one marketable; now one must demonstrate literacy in the application of technology to remain competitive (Levin & Wadmany, 2008). The acquisition of technology competence in any workplace often involves the use of educational technology tools in the learning process. Two of the most recognizable technology tools today are the computer and the Internet, which provide the backbone for most information and communication technologies.

The computer.

Perhaps technology has become much more than a tool; it has become the "very essence of man" and the "environment in which man undergoes modifications" (Galimberti, 2009, p. 3). In January 1983, *Time* magazine gave the title "Man of the Year" to a machine, the computer (Rosen & Weil, 1995). "Computer" originally referred to "a *person* who solved equations; it was only around 1945 that the name carried over to machinery" (Ceruzzi, 1998, p. 1). The earliest machines were called "calculators," but some, such as the Electronic Numerical Integrator and Computer, dubbed ENIAC, integrated computer as part of their name (Ceruzzi, 1998). The ENIAC, designed by engineers at the University of Pennsylvania during World War II, functioned as a huge electronic equation solver used to assist the military in calculating missile trajectories (Ceruzzi, 1998). In 1951, the Universal Automatic Computer, or UNIVAC, vastly improved on previous calculating machine designs and made electronic computing available to "scientists, engineers, and businesses" (Ceruzzi, 1998, p. 15). Punched cards emerged as a primary means of data input. Commercial computing continued to increase through 1959, with the installation of large mainframe computers run by computer center technicians (Campbell-Kelly & Aspray, 1996; Ceruzzi, 1998). As computer hardware size decreased, the computer assumed the name minicomputer; however, the number and complexity of programming languages increased during the 1960s (Ceruzzi, 1998).

The first computer "software" was machine-friendly, not person-friendly. As computers evolved in capacity and complexity, more effort and cost went into software development. Although the cost of computer hardware continued to fall, the cost of software continued to rise; however, a myth about software costs exceeding hardware costs has been perpetuated in the literature (Ceruzzi, 1998). The truth borne out by recent evidence suggests that the ratio of hardware to software costs has remained reasonably constant (Ceruzzi, 1998, p. 82). Still, the trend that "soft" costs, such as software, programming, and human resources, make up a significant portion of a computing solution appears early in the history of electronic computing. The next phase in computer evolution involved the development of powerful user-friendly software languages and applications between 1952 and 1968 (Ceruzzi, 1998).

A major breakthrough in improving the interface between humans and computers came with the arrival of the first Macintosh computer from Apple in January 1984 (Campbell-Kelly & Aspray, 1996). Prior to the Macintosh, users input commands into the personal computer via a disk operating system (DOS), made popular by Microsoft. In November 1985, Microsoft released its first attempt at the graphical user interface, or GUI, and joined Apple in the task to make interaction with the personal computer less intimidating to the average user (Campbell-Kelly & Aspray, 1996). Thus, the term "desktop" came to represent the organized software interface on the personal computer

(Campbell-Kelly & Aspray, 1996). Users were able to interact with menus and icons, rather than having to write lines of specific complicated programming code. Now that users could interact more efficiently with the computer, the focus shifted to networking with other computer users locally and over long distances.

The Internet.

Despite the Internet's popularity, it is difficult to define (Ceruzzi, 1998). The Internet is not a single network, but a myriad of many different networks throughout the world (Ceruzzi, 1998). Initially a collection of networks of the military, scientific, educational, and commercial communities, the Internet has grown significantly due to the standardization of communication protocols. Ethernet and the transmission control protocol/internet protocol (TCP/IP) provide the glue that connects the world's individual communications networks (Ceruzzi, 1998). The modern-day Internet began with a project of the U. S. Department of Defense Advanced Research Projects Agency Network (ARPANET). ARPANET originally connected UCLA, the Stanford Research Institute, University of California at Santa Barbara, and the University of Utah through a wide-area network that grew to include 11 locations from Southern California to Harvard and Massachusetts Institute of Technology in the Northeast (Ceruzzi, 1998). Local area networks, called LANs, became more widespread, branching out into wide-area networks (WANs), and users began to use the connected networks primarily for file transfer and remote log-in access. With the development of hypertext markup language, or HTML, the final ingredients for what we know as the World Wide Web were finally in place. Today, end users perform complicated searches and queries that would have been nearly impossible decades earlier without significant knowledge of hardware and software, not to mention that the cost would have been prohibitive to any individual consumer. The Internet has changed all of this and has greatly expanded and simplified access to information very affordably to consumers.

"In the fall of 1990 there were just 313,000 computers on the Internet; by 1996, there were close to 10 million" (Campbell-Kelly & Aspray, 1996, p. 283). According to the International Telecommunications Union (ITU; as cited in Miniwatts Marketing Group, 2010), an agency of the United Nations that tracks Internet usage statistics, the percentage of U.S. population using the Internet has grown 151.6% from 44.1% in 2000 to 77.3% as of 2010. The main function of the Internet in 1996 was the transmission of electronic mail (Campbell-Kelly, & Aspray, 1996), but recent trends suggest the Internet serves a more multifaceted role today.

The Internet Activity Index (IAI) maintained by the Online Publishers Association (OPA; 2010) "provides a unique way of looking at consumer engagement online, dividing Internet usage into five distinct activities: *Content*, *Communications*, *Commerce*, *Community* and *Search*" (para. 1). As of July 2010, 37.8% of the more than total hours spent by consumers in the United States on the Internet involved viewing Content (OPA, 2010). This category accounts for the largest share of Internet activity by consumers. During the same period, consumers' time online was estimated as follows: 25.5% on Community, 20.8% on Communications, 11.3% on Commerce, and 4.6% on Search activities (OPA, 2010). The only usage category not trending higher in percentage of time spent was Community, which dropped by 9.6% compared to June 2010 due to less participation on Facebook and MySpace (OPA, 2010). The results do not indicate that use of e-mail has decreased; rather, the availability of Content on the

Internet has exploded in volume over the last decade. These statistics do not include data from educational domains; however, the computer and the Internet seem to be the educational technologies "driving change in post-secondary institutions" (Bates & Poole, 2003, p. 10). Educational technology has changed exponentially, but it has long been part of the human learning process.

Technology in education.

Educational technology dates back long before the advent of computers in the classroom (Bates & Poole, 2003). In the ninth century A.D., the Chinese created a printing press, although it was Gutenberg's printing press that radically changed the dissemination of information and knowledge (Bates & Poole, 2003). In the nineteenth century, better roads, railways, and a postal system paved the way for the first distance education efforts through correspondence. The pace of technological innovation greatly increased after the discovery of electricity and the advent of telephone, radio, television, and computer technologies in the 20th century (Bates & Poole, 2003).

Students have come to expect computers and information technology as part of their classroom experience. The younger generation of tech-savvy students has motivated school system administrators, instructors, and textbook publishers to integrate technology into the learning environment (Lavin et al., 2009). This research study focuses on computers and the accompanying hardware, software, connectivity, support, and infrastructure required to use computers in the educational environment. While computers are only one segment of educational technology, resources required to implement computers in the classroom make up the vast majority of educational technology. Throughout the history of technology in education, teachers have historically been recipients of pressure by administrators, students, vendors, and the public to put the latest educational technology to use in the classroom (Cuban, 1986).

Brief history of technology in education.

The list of technological innovations suggested as ways to improve upon teachers' lectures has included things such as chalk and slate, books, pictures, film, radio, audio and visual recordings, mimeograph, copy machines, television, and more recently computers and the Internet (Cuban, 1986). For centuries, education reformers have promoted integration of technology into the classroom. Resistance against reformers such as administrators, executives, and wholesale vendors, has been demonstrated by teachers' infrequent adoption and integration of educational technology into the classroom (Cuban, 1986; D. M. Watson, 2001). Cuban (1986) studied archived data describing the introduction of film and radio into the 1920s classroom and the emergence of instructional television in the classroom of the mid-1950. Even with flawed evidence, the results seem to indicate teachers infrequently used film or radio. Reasons for nonuse included lack of equipment, poor quality of existing equipment, schedule difficulties, lack of information, and simple lack of interest by the teacher (Cuban, 1986). Instructional television promised to power the next revolutionary changes in education.

Use of instructional television in the classroom seemed to increase in 1953 after the FCC allocated 242 communications channels for educational purposes (Cuban, 1986). In the first decade of use, instructional programming was used to aid the classroom teacher, provide supplemented television instruction, and even as a "total instructional program presented by [a] television teacher" (Cuban, 1986, p. 29). Results obtained from self-report surveys, direct observation, and case studies suggest that instructional television use does not serve as a primary delivery method, and that very few teachers integrate it "willingly, consistently, and with enthusiasm" (Cuban, 1986, p. 49). As technology has continued its evolution into the age of computers and the Internet, the challenge to convince teachers to integrate technology in the classroom through new teaching practices still exists (Brown, 2006; D. M. Watson, 2001). Technology can be a change agent for teaching and learning by serving as a source of knowledge, a mechanism of transmitting content, and "an interactive resource furthering dialogue and creative exploration" (Levin & Wadmany, 2008, p. 234). The power of technology to change varies according to how it technology is viewed by potential users.

Information and communication technology (ICT) in education can be viewed from several perspectives. ICT can be the object of study by students who may take a course in technology in order to learn about ICT and how to use it in everyday life (Drent & Meelissen, 2008). ICT may comprise an aspect of a separate discipline for the purpose of helping students develop skill and competence in applying ICT in their professional or vocational lives (Drent & Meelissen, 2008). ICT can serve as a medium designed to improve students' learning experiences. Computer-based instruction in schools often supplements or replaces conventional teaching methods (Kulik & Kulik, 1991, p. 75). Niemiec and Walberg (as cited in Granello, 2000) noted that by 1959, computer programs had appeared that could teach subjects, an entire elementary curriculum, and even college-level courses. The possibilities for applying technology in the classroom seem endless.

Impact of technology on education.

Bates and Poole (2003) described the impact of technology on education and training as being "as great as on any other area" (p. 8); however, research has suggested that integration of technology into the classroom seems to be lagging (Cuban, 2001; Levin & Wadmany, 2008). Controversy exists concerning the impact of technology integration in education (Strudler, 2010). Cuban (2001) reported that despite the massive amount of time and money invested in computer hardware, software, infrastructure, support, and training for students and teachers, these "have yet to yield even modest returns or to approach what has been promised in academic achievement, creative classroom integration of technologies, and transformations in teaching and learning" (p. 189). Cuban seems to be correct in citing the inability of computers and technology to transform most educators' teaching practices; however, even in light of the lack of evidence of powerful pedagogical transformation, "computers are clearly becoming a valuable and well-functioning instructional tool" (H. J. Becker, 2000, p.29). Efforts to create computer programs for drilling, tutoring, and testing students have increased; however, studies exploring the effectiveness of such programs have not provided conclusive evidence that technology has been effective overall (Kulik & Kulik, 1991). Although disagreement exists as to the extent of the impact of educational technology (Hannafin, Orrill, Kim, & Kim, 2005), its availability continues to expand.

The universality, power, and adaptability of ICT have steadily increased (Levin & Wadmany, 2008), but the steady increase in the availability of computers and the Internet for education has not changed the imbalance between the level of technology integration expected of educators and the actual use of technology in the classroom (Fabry & Higgs, 1997; Levin & Wadmany, 2008). The gap between implementation of ICT in the classroom and the rapid advancement of technology seems to be related less to a lack of availability of technology and training and more to the incongruence between new ICT and existing classroom teaching practices and materials and how they are used (Levin & Wadmany, 2008; Lowther, Ross, & Morrison, 2003). Proponents of educational technology have always held high expectations that technology would change teachers' practices, resulting in improvements in students' learning and retention (Hannafin et al., 2005). Efforts to create computer programs for drilling, tutoring, and testing students have increased; however, studies exploring the effectiveness of such programs have not provided conclusive evidence that technology has been effective overall (Kulik & Kulik, 1991). Any effort to "enhance learning and teaching with technology is about change in some way" (Strudler, 2010, p. 228), and educational technology is all about change. ICT requires change in teaching styles and approaches to learning (Watson, 2001). Yet the use of educational technology as change agent is not welcomed by all (Hannafin et al., 2005).

Not everyone supports the use of computers in education. "Given how many hours a day children pursue mediated experience through cinema screens, television screens, cell phone screens, and video game screens, it hardly makes sense to add a computer screen to the mix" (Talbott, 2007, p. 133). Talbott (2007) suggested that funding for computers "could have been used for reducing class size" (p. 134). Proponents of educational technology have cited the necessity of educational technology for engaging and collaborating with students who have grown up with technology (Prensky, 2005/2006) and who have come to expect connection to the Internet. Between

1994 and 2005, the percentage of public schools with access to the Internet increased from 35% to nearly 100%, and the percentage of instructional rooms with Internet access increased from 3% to 94% (National Center for Education Statistics [NCES], 2009).

With the increase in widespread availability of Internet access in both classrooms and students' homes, educational institutions have begun to deliver education over the Internet (Tallent-Runnels et al., 2006). During the 2006–2007 academic year, 66% of the nation's 2-year and 4-year postsecondary institutions offered distance education courses (NCES, 2009). The survey by the Department of Education noted that approximately 11,200 college-level programs offered during the same period were designed for completion entirely through distance education. Reasons cited for offering online courses include improved student access to education, especially for nontraditional students, and higher graduation rates (Wasilik & Bolliger, 2009). Though the definition of classroom has changed to meet the expectations of online education, the practices used by educators have been slow to change; consequently, efforts at online education have sometimes been challenged by the lack of research and understanding of variables affecting online learning (Tallent-Runnels et al., 2006).

In order for educational technology to be effective, educators must reexamine the appropriateness of existing pedagogy in view of how technology changes instructional preparation, delivery, and evaluation (Cercone, 2008; Lavin et al., 2009). For example, in distance learning, courses require instructors to take on new roles in the online classroom. E-learning instructors must understand their role in how students learn in asynchronous discussion forums (Mazzolini & Maddison, 2007). Instructors must also understand the different needs of adult learners in the online environment as compared to the learning needs of traditional college students (Cercone, 2008). Traditional teaching pedagogy and assessment used in the face-to-face classroom need review and revision for use in online courses, especially with adult learners (Ausburn, 2004).

Effective online instruction requires different outcome measures than traditional face-to-face instruction. For example, measuring the quality of students' learning experiences simply by the length and number of discussion thread posts may not be effective at discerning the quality of learning. Mazzolini and Maddison (2007) found that the frequency, timing, and nature of instructors' posting often had unintended effects in a study of online forum interactions in an online astronomy course. Rather than increasing student participation in online discussion forums, the frequency of instructor postings to the forums had an inverse relationship to overall discussion thread length and number of posts by students (Mazzolini & Maddison, 2007). Whether instructors posted questions, answers, or a mix of questions and answers had little effect on students' responses on evaluation surveys; however, students expressed a dislike for housekeeping posts by instructors. The results of the study indicated a discrepancy between most instructors' perceptions that any increase in their posting activity would result in an increase in student activity or at least no change in the quantity of student posts (Mazzolini & Maddison, 2007). Evaluators of e-learning instructors cannot rely on intuitive measures to gauge instructor effectiveness.

Evaluation of distance learning can require a variety of assessment tools and procedures based on differences among academic disciplines. Analysis of online course management system tool usage logs and course evaluations gathered during a 5-year qualitative study analyzing the differences between online course delivery methods among academic disciplines revealed differences in online assessment methods and tools based on academic discipline (Smith, Heindel, & Torres-Ayala, 2008). Smith et al. (2008) concluded that e-learning educators in the applied disciplines, such as engineering, applied mathematics, nursing, and education, used a greater variety of tools and student assessment techniques than e-learning educators used in pure disciplines such as natural sciences, mathematics, chemistry, psychology, humanities, and other social sciences. Billions of dollars have been spent wiring schools and providing hardware and software in hopes of creating an environment conducive to creative integration of technology in the classroom; however, there seems to be little evidence of any link between promised outcomes and effort invested, at least through 2001 (Cuban, 2001).

The impact of technological innovation in education is not limited to measurement in financial costs. The human and organizational costs have remained greatly underestimated and vastly underreported (Monke, 1999). For example, Monke (1999) informally tracked the impact of technology integration in the Des Moines Public Schools (DMPS). The state allocated $9 million to DMPS over a 5-year period specifically for purchases of technology equipment. The school system simultaneously committed $4 million to the purchase and installation of a new enterprise system. While Monke found the financial costs associated with the management of the funds and technology project were enormous, the cost of human and organizational resources were even higher.

As pressure to meet budget resulted in personnel cuts for DMPS, the need to hire additional technical staff had to go unrequited due to lack of funding for human resources. The result was that teachers and staff were forced to adapt to the organizational changes brought on by the new enterprise system. Time that normally went into instructional activities went into learning and maintaining computer hardware and software. One counselor resigned after a year, remarking, "I became a counselor to work with students, not computers" (Monke, 1999, p. 9). The counselor added, "They [the computers] are supposed to serve us, not us them" (Monke, 1999, p. 9). The experience of DMPS illustrates how the process of integrating technology in education may create a bigger problem for educators and students than the problems associated with a lack of available technology. The real impact of technology in education may be measured more accurately in terms of its impact on students and educators.

Impact on students. Technology in education is expected to enhance students' learning and possibly make the process more convenient and cost efficient; however, the benefits seem worthless without a deepening of students' learning experiences (Weigel, 2002). Students' perceptions and experience must be considered as a primary source for measuring the impact of technology.

> One might conclude that a proper worldview, a flexible institution, and a skilled faculty are sufficient conditions for producing learning that matters. However, it is necessary to pause and acknowledge it is the students—who they are, what they want, how they live—that hugely affect possibilities for learning. The experiences the students unpredictably bring into the academy evoke and stimulate the content and pathways of the inquiry. (Mandell & Herman, 2007, p. 351)

Students have grown up with technology in the digital age, but this does not mean they have achieved technological literacy (Judson, 2010). Today's younger students have been described as *digital natives*, and teachers have been called *digital immigrants* who teach with an *accent* in that they themselves did not grow up natively with technology (Prensky, 2005/2006). Some view students as being so far ahead of educators that educators must implement drastic measures in order to catch up (Prensky, 2005/2006). In reality, this idea seems to represent "an academic form of moral panic" (Bennett, Maton, & Kervin, 2008, p. 782). For example, Prensky (2005/2006) called for "more radical solutions" (p. 9) to replace in-service training and other "traditional catch-up methods" (p. 9) used to help teachers keep up with the digital natives.

Students do seem more conversant with technology, and they may seem different from previous generations of students; however, a review of the digital native literature highlights incongruence between the veracity of the calls for radical solutions to meet the needs of digital natives as students and the empirical evidence of teaching digital natives (Bennett et al., 2008). "[T]he digital native metaphor assumes digital literacy. While students today are certainly far more comfortable and confident in approaching technological tools than students of 20 years past, this poise does not necessarily translate into being literate in technology" (Judson, 2010, pp. 271-272). Kolikant (2010), in a follow-up to previous research into attitudes of students in a book-oriented school toward the use of digital technology in class, found evidence that students believed the Internet oversimplified schoolwork. Students also viewed their generation "as not as good at learning as the pre-ICT generation" (Kolikant, 2010, p. 1384). Despite the study's limitations due to sample size and makeup, the results offer a competitive viewpoint to previous conceptualizations of digital natives as better learners. Individual outcome studies often lack external validity regarding the general effectiveness of computers in education (Kulik & Kulik, 1991) due to limitations such as research methodology and sample size issues. Even though research into the effectiveness of ICT in education is still nonconclusive and in its infancy, evidence is mounting that seems to highlight the positive impact on students' cognitive development (Brown, 2006).

Students of all ages seem to have benefited from positive aspects of technology in education (Kulik & Kulik, 1991). Lowther et al. (2003) studied the differences in teaching and student behavior in classrooms with individual laptops provided for middle-school students compared to classrooms with a limited number (a minimum of five computers per class) of desktop computers. Teachers in the laptop groups and the control groups received the same technology integration training. The study sought evidence that students using laptops achieved differently than those in control groups with some desktop computers provided. Researchers observed few differences in the teaching methods across all the groups. Although study findings are not conclusive, limited by the study's ex post facto design, results suggest that students who had access to laptop computers performed significantly better on writing assessments and problem-solving tasks, and they used computers more extensively without prompting compared to students without access to laptop computers (Lowther et al., 2003). Performance measures for students show up as part of students' grade point averages (GPAs). Lei (2010) categorized student technology uses into five domains and found that none had any statistically significant effect on students' GPAs; however, "this does not mean that technology does not affect student learning" (p. 4). The results of the study could be skewed by the grouping of technologies into categories that were too general to highlight the individual effects on student outcomes.

Ridley and Husband (1998) hypothesized that students taking online courses would have higher GPAs than those taking face-to-face courses. The researchers believed online students would have greater temptation to violate academic integrity and turn in work that was not their own because of the lack of physical connection to the course instructor. The results of the study, though inconclusive due to confounding variables left uncontrolled, indicated that online students' GPAs were actually lower than face-to-face students' GPAs and did not improve over time (Ridley & Husband, 1998). However, student GPA does not provide the only measure of online education's effectiveness.

Positive effects on individual student performance may promote collaborative learning among students with access to computers and ICT, especially in higher education. At the college level, undergraduate and graduate students commonly use computers to create projects, take study notes, analyze data, communicate with fellow students and faculty through e-mail and instant messaging, and access Internet resources such as web sites and library databases (Parayitam, Desai, Desai, & Eason, 2010). Technology has provided students with ways to work more efficiently, both individually and collaboratively, and it seems to have provided a way to appeal to students' preferred learning styles.

Advocates of computers in education believe technology makes the learning process easier for students because of improved adaptation to individual students' unique learning styles (Hannafin et al., 2005). Technology integration in adult education requires educators to recognize the unique learning styles of adults. Institutions of higher learning have identified "part-time *adult learners* as the new majority, with non-traditional working adults over age 26 now comprising over 50% of the American post-secondary student population" (Ausburn, 2004, p. 328). Institutions and instructors must understand the needs of adult learners, and they must learn how to address these needs in the online classroom (Ausburn, 2004; Cercone, 2008).

Effective teachers of adults in online environments recognize that each adult learner is unique, and adult learners differ significantly from children (Cercone, 2008). Bailey and Card (2009) conducted one-on-one interviews with award-winning e-learning instructors in South Dakota in order to understand what pedagogical practices experienced e-learning instructors deemed effective. Andragogy, constructivism, and transformational learning provided the pedagogical framework for the phenomenological study. Fostering relationships, engagement, timeliness, communication, organization, technology, flexibility, and high expectations emerged as eight effective pedagogical practices for the online educational environment (Bailey & Card, 2009, p. 154).

The e-learning instructors viewed tools such as e-mail and timely communication as ways to foster relationships and engage students, and instructors realized the importance of flexibility due to inherent issues in technology availability and reliability. Many instructors also integrated online technology into their face-to-face courses. For example, using WebCT's classroom management system to post supplemental course materials for students in face-to-face courses (Bailey & Card, 2009) enhanced students' learning experiences. Although blended learning is more than simply posting lectures and notes on a web site (York, Yang, & Dark, 2007), students and educators benefit from having course materials, goals, and objectives clearly defined and available in the online environment.

Impact on educators. The Survey of Higher Education Faculty (SHEF; 2010) collected responses from 555 full-time faculty across 350 accredited colleges in the

United States and Canada in 2010. Participants were asked to respond regarding their knowledge and use of educational technology, which included such topics as distance education, course management systems, student response systems, electronic whiteboards, in-class Internet access, computer labs, and PowerPoint (SHEF, 2010). When asked about how well their school had prepared them to use available ICT, only 13.29% rated their school's performance as terrible or poor (SHEF, 2010, p. 25). In other words, colleges seem to be doing an acceptable job in training faculty to use the information technology provided. Availability of ICT does not always mean that faculty will use technology in the classroom or use ICT effectively (Inan & Lowther, 2010).

The prevalence and frequency of ICT use by higher education faculty varies according to the interaction of several demographic factors, including age, pay, rank, private versus public school setting, and academic discipline (SHEF, 2010). For example, "more than 48% of faculty in business and related fields" (p. 22) reported having taught a course via distance learning, compared to 28.57% of education faculty (SHEF, 2010). Despite the emerging research into factors that influence higher education faculty members' decision to integrate educational technology, a gap still exists in the literature regarding the decision-making process used by faculty in learning and adopting new technology for the classroom (Nicolle & Lou, 2008). Counselor educators, as members of the academy, face the same decision-making processes as their peers in other disciplines.

Technology in counselor education.

Counseling and computers have a history that extends back into at least the 1950s and 1960s (P. F. Granello, 2000), and counseling professionals have been integrating technology into their work over the past 30 years (Cabaniss, 2002). In a Delphi study, Cabaniss (2002) reported that Internet, e-mail, web sites, videoconferencing, listservs, computer simulation, databases, chat rooms and discussion groups, and other or non-Internet-based technologies have been used to help counselors in their work, and it was predicted that by 2008, nearly every task within the counseling profession would involve one of these technologies. Early attempts to use computers in place of therapists ended with the realization that computers would probably not become replacement therapists (P. F. Granello, 2000). Efforts still exist to mimic the therapeutic relationship by using the computer. For instance, therapists using cognitive behavioral therapy have created a program containing prewritten responses for individualized corrective feedback to clients exhibiting faulty cognitions (Helgadóttir, Menzies, Onslow, Packman, & O'Brian, 2009). For the most part, though, the quest to use computers to replace therapists has not attracted as strong an interest as the task of integrating computers in education, but the application of technology to the counselor education process is just beginning (Karper, Robinson, & Casado, 2005).

Impact on counseling students. Students' exposure to a wide array of technology in their counselor training programs can "enhance practice management, client and professional education, and access to information that can directly impact counseling effectiveness" (ACES, 2007, p. 1); therefore, many counselor education programs have integrated computers and technology into the classroom (Hayes, 2008). Karper et al. (2005) highlighted the need for counselor educators and programs to integrate web-based instruction, computer-assisted instruction, and the Internet in the counselor education classroom, and students have demonstrated acceptance of technology in their counselor education programs (Berry et al., 2003; Hayes & Robinson III, 2000). Examples of technology used by counseling students include e-portfolios (Carlson & Yohon, 2008; Walker, Rehfuss, & Parks-Savage, 2008); online supervision (Chapman, 2008; Hayes, 2008; McAdams & Wyatt, 2010; Vaccaro & Lambie, 2007); web sites (McGlothlin, West, Osborn, & Musson, 2008); e-mentoring programs for use by school counselors in rural settings (Johnson & Daire, 2008); computer-assisted instruction, interactive computer simulation, and web-based instruction (Hayes, 2008); and counseling laboratories and clinics equipped with sophisticated ICT (R. W. Lee & Jordan, 2008). Counseling education has long recognized the importance of providing adequate training for counseling students in using technology, and the development of specific measurable goals to accomplish the task has slowly begun to evolve during the past decade.

In April 1999, the ACES Executive Council endorsed 12 technical competencies for counseling education (ACES, 1999b). The competencies apply to counseling students and function as guidelines for the development of counselor education programs. The competencies became more encompassing in 2007 (ACES, 2007) with the addition of separate technology competencies for programs graduates as summarized in Table 1. The basic rationale underlying the development of each of the 12 competencies included specific details of each competency broken down into three categories: *basic knowledge, basic competence*, and *integrated competence* (ACES, 2007; Sabella et al., 2010).

Master's graduates are expected to possess basic knowledge that "focuses on the graduate's ability to recognize and be informed regarding technology as it applies to the counseling profession" (ACES, 2007, p. 2) and basic competence across the first 11 competencies (Sabella et al., 2010). Graduates of master's programs should also "demonstrate basic competence" (ACES, 2007, p. 2) consisting of the basic technology skills needed for a new counselor entering the profession. The Standards Committee of the Technology Interest Network proposed the integrated competence level as "an advanced level of ability in technology that some graduates will acquire or possess" (p. 2), but that was "beyond the current reach of many counselor education and training programs" (ACES, 2007, p. 2). Students in doctoral counselor education programs are more likely to attain integrated competence.

Doctoral graduates are expected to "extend master's level competence in the application of computer and related technology to assess the appropriateness of technology applications to teaching, practice, and research" (ACES, 2007, p. 2). Students at this level integrate "knowledge and skills . . . with pedagogical knowledge of how these competencies can be developed in future counselors" (ACES, 2007, p. 2). The guidelines focus on encouraging doctoral counselor education programs to focus on "exposing their doctoral students to a variety of technology skills beyond those of the master's degree that fit best with the future demands on the doctoral student's anticipated areas of employment or practice" (ACES, 2007, p. 9). Advanced competencies for doctoral students are provided according to whether students plan to concentrate on research, practice, or teaching.

Table 1

Comparison of ACES Technology Competencies

1997 At the completion of a counselor education program, students should	2007 *Master's/Doctoral Level Technology Competencies* [1]
1. be able to use productivity software to develop web pages, group presentations[2], letters, and reports;	1. be able to use productivity software to develop web pages, *word processing documents* (letters, reports), *basic databases, spreadsheets, and other forms of documentation or materials applicable to practice;*
2. be able to use such audiovisual equipment as video recorders, audio recorders, projection equipment, video conferencing equipment, and playback units;	2. be able to use such audiovisual equipment as video recorders, audio recorders, projection equipment, video conferencing equipment, playback units *and other applications available through education and training experiences;*
	3. be able to acquire, use and develop mulitmedia software (i.e., PowerPoint/Keynote presentations, animated graphics, digital audio, digital video) applicable to education, training, and practice;
3. be able to use computerized statistical packages;	4. be able to use statistical software *to organize and analyze data* [3];
4. be able to use computerized testing, diagnostic, and career decision-making programs with clients;	5. be able to use computerized and/or internet-based testing, diagnostic, and career decision-making programs with clients;
5. be able to use email;	6. be able to use email;
6. be able to help clients search for various types of counseling-related information via the Internet, including information about careers, employment opportunities, educational and training opportunities, financial assistance/scholarships, treatment procedures, and social and personal information;	7. be able to help clients search for and evaluate various types of counseling-related information via the Internet, including information about careers, epmployment opportunities, educational and training opportunities, financial assistance/scholarships, treatment procedures, and social and personal information;
7. be able to subscribe, participate in, and sign off counseling-related listservs;	8. be able to subscribe, participate in, and sign off counseling related listervs *or other internet-based professional communications applications;*
8. be able to access and use counseling-related *CD-ROM* [4] databases;	9. be able to access and use counseling-related research databases;
11. be able to use the Internet for finding and using continuing education opportunities in counseling;	10. be able to use the Internet to locate, *evaluate* [5], and use continuing education, *professional development and supervision options in counseling;*
9. be knowledgeable of the legal and ethical codes that related to counseling services via the Internet;	11. *be able to perform basic computer operation and maintenance tasks;*
10. be knowledgeable of the strengths and weaknesses of counseling services provided via the Internet;	12. be knowledgeable about legal, ethical, and *efficacy* [6] issues associated with delivery of counseling services via the Internet
12. be able to evaluate the quality of Internet information	

NOTES: *Differences between 1997 & 2007 shown in italics above.*

[1] Recognition of additional doctoral competencies reflected in 2007 revision

[2] *Group presentations* was expanded and became competency #3 in 2007

[3] Reworded 1997 comptency #3 to add outcome

[4] Changed to reflect trend away from CD-ROM data storage

[5] Combined 1997 competencies #11 & 12 into 2007 #10

[6] Added *efficacy* of counseling via Internet, and combined # 9 & 10 from 1997

Source: Adapted from ACES (1999b; 2007) Technical competencies for counselor education students: Recommended guidelines for program development. Used by permission.

Doctoral counseling students seeking a research concentration should demonstrate competence in statistical software packages or qualitative analysis software, although competence in both are suggested (ACES, 2007). For a practice concentration in agency and private practice settings, the standards recommend competency in understanding and application of counseling agency database management systems such as Therascribe™, and a concentration in school settings requires students to have familiarity with student information systems and related issues. Finally, doctoral students choosing a teaching concentration should have exposure to distance learning web-based class management technology, videoconferencing, web-based and Internet-facilitated conferencing systems, technology-enhanced classrooms, and a variety of technology-assisted teaching and delivery methods used in instruction (ACES, 2007, p. 10). Little research exists into the diffusion and adoption of the 1997 version of the technology competencies, and many counselor educators may be unaware of the 2007 revisions. The competencies of counseling students at the master's and doctoral levels have undergone revisions, and counselor educators need to set the example for students by viewing the new expectations positively. The 2009 CACREP standards failed to incorporate the work of the ACES Technology Interest Network on the 2007 technology competencies (M. Jencius, personal communication, April 19, 2011).

Overall, counseling students share a favorable attitude toward the use of technology in their counselor education programs. The results of a study of 44 first-year counselor education students (Hayes & Robinson, 2000) suggested that students' self-reported attitudes toward computers and multimedia instruction were positive in many respects. Eighty-four percent of the study participants believed computers increased productivity and quality of their learning experiences, and 74% viewed computers as a good way to provide individualized instruction (Hayes & Robinson, 2000). Students disagreed with the notions that computers threatened instructors (63%), took up too much time and effort (86%), and were only productive in the science and technical educational disciplines (78%; Hayes & Robinson, 2000).

Impact on counselor educators. Although some studies have explored technological competence in counseling students (Berry et al., 2003; Chandras, 2000), few studies exist that have explored technological competence of counselor educators (Myers & Gibson, 1999). No study was located that explained the effects of intrinsic and extrinsic factors affecting how counselor educators integrate technology into the counselor education classroom. This gap in the counselor education literature seems highly incongruent with the recent impetus to hold counseling students accountable for gaining technological skill and competence. Most of the studies regarding counselor educators' technology competency have used self-report measures to explore levels of technology competency. Self-report measures cannot provide conclusive evidence of levels of competency and only give insight into how study participants view their skill level (Chen, 2010). A test of computer skill using specific criteria could be used to determine the actual competency level of counselor educators; however, it would be difficult to create an effective object test that could be standardized due to the varied nature of technology and its uses in education. The variables explored in this study are therefore assessed using self-report measures.

When the ACES technology competencies originally emerged, the ACES newsletter, *Spectrum*, included a survey designed to solicit the self-assessment of ACES members' technology competence (Myers & Gibson, 1999, p. 4). Only 92 participants responded, of which 62 respondents were counselor educators. The *Spectrum* survey has limited generalizability to ACES membership in that it did not include a way to validate how participants learned of the survey, nor did it include a means of validating ACES membership of participants (Myers & Gibson, 1999). As in other research into technology competency, self-assessment of participants' technology competency did not provide either an objective measurement of the absolute level of each counselor educator's technology mastery or a relative level of competency compared to others taking the survey. Future research methods and assessment instruments may offer the tools needed to explore the adoption of technology in counselor education.

Integration of educational technology.

Any technological innovation offers little benefit unless the innovation permeates the population of potential users and an adequate number of individuals or organizations adopt the innovation (Rogers, 2003). The value of a technology innovation "is realized only when information systems are utilized by their intended users in a manner that contributes to the strategic and operational goals" (p. 666) of the organization (Agarwal & Karahanna, 2000). The search to explain how users adopt technology has produced several theoretical models to explain individuals' attitudes and behaviors toward technological innovations (Agarwal & Karahanna, 2000). Two of the most widely researched theories proposed are innovation and diffusion theory (Rogers, 2003) and the technology acceptance model (TAM; Davis, Bagozzi, & Warshaw, 1989; Y. Lee, Kozar, & Larsen, 2003).

The focus of this research study is on the interaction of individual and institutional-level factors affecting technology integration by counselor educators, and further discussion of innovation adoption lies beyond the scope of this study. In this study, technology integration refers to the use of ICT for instructional preparation, for instructional delivery, and as a learning tool (Inan & Lowther, 2010). The use of a tool, however, does not result in fluency or literacy in its application (Judson, 2010; Sabella et al., 2010). Technical literacy builds at a faster pace when the technology tools are put to use in the teaching and learning process.

In education. The pace of technology integration in grades K-12 has been much faster than in institutions of higher education (Allsopp, McHatton, & Cranston-Gingras, 2009) where changes in information and communications technologies seem to take place more gradually (Kirkup & Kirkwood, 2005). Ertmer (2005) reviewed large-scale studies indicating that teachers are using technology in classrooms more often; however, teachers limit the use of technology to more low-level tasks such as word processing. According to self-report data, teachers have not changed their teaching styles to accommodate best practices for technology integration as outlined in the literature (Ertmer, 2005), and they seem to stick with what they think works best for students (Cuban, 2001; Zhao & Frank, 2003). Some teachers avoid implementing new technology due to additional time or cost involved in learning the technology.

Although having to integrate technology into a course might seem to increase preparation time required for the course, nothing in the literature indicates specific guidance as to whether such an increase actually takes place (Wantz et al., 2004). If such an increase in workload does exist, compensation for the increase has not kept pace. For example, 54% of counselor educators in one study (Wantz et al., 2004) reported having received no additional compensation for time spent developing an online course. Twenty-two percent received time off from teaching, while another 18% reported receiving monetary compensation for extra time spent developing an online course. More research is needed to understand the time required in incorporating technology into course teaching (Wantz et al., 2004) by experienced and preservice teachers.

Preservice teachers have benefited from increased confidence in their abilities to integrate technology in their teaching. The special education department within an undergraduate education program at one large southern university implemented a one-to-one laptop initiative for faculty and preservice teachers in order to explore how the integration of wireless technology throughout the curriculum affected class and field experiences of participants (Allsopp et al., 2009). The faculty placed emphasis on both technical skills and the process of integrating the technology successfully in teaching activities (Allsopp et al., 2009). A cohort of 13 undergraduate special education majors were observed over a 4-year period. Study participants reported an increase in their confidence in using technology in teaching across the three semesters they were surveyed, with the largest increase occurring during their first semester (Allsopp et al., 2009). Although students indicated they would use technology in their teaching activities, they did not articulate any specific examples in responses to open-ended questions posed concerning how they might use technology in teaching. Preservice teachers look to experienced educators as examples of how to use and integrate technology in education (Parker, 1997).

Technology integration in education has gained some momentum with experienced educators over the past 15 years. Spotts and Bowman (1995) surveyed faculty at a midwestern, public university and reported word processing as the technology most familiar to and used by faculty, and video technology was used on a weekly basis by less than 20% of the faculty (Spotts & Bowman, 1995). At that time, only 16% of the faculty surveyed reported “good to expert knowledge of presentation software and computer conferencing, 13% for multimedia, and 9% for distance learning” (Spotts & Bowman, 1995, p. 62). Less than one third had experience with e-mail at the time. Two years later, findings from a college-wide self-study by 42 faculty members at the College of Education at Louisiana Tech University indicated three key tasks required for the development of confidence of future generations of teachers in using technology (Parker, 1997). Teachers must increase their use of technology, increase opportunities for students to use technology, and model the integration of technology in the classroom (Parker, 1997, p. 108).

Jacobsen (1998) reported similar results regarding word processing use. In a survey of 76 educators from two major North American universities, 81.6% of the respondents reported having substantial or extensive expertise in using word processing. Seventy-five percent of those surveyed reported having substantial or extensive expertise in using e-mail (Jacobsen, 1998)—a significant increase over the reported skill in using e-mail reported by Spotts and Bowman (1995). Small sample size and insufficient comparative demographic information precludes any speculation about the difference in e-mail expertise reported between the groups; however, the range of expertise reported in e-mail use may highlight the lack of consistency in research methodology and comparative assessment techniques. The same inconsistencies in understanding technology integration exist in the literature concerning technology integration by counselor educators.

In counselor education. Research into the integration of technology in counselor education has been sparse compared to research of technology integration in education, and the current state of technology integration in counselor education remains relatively unexplored (Quinn et al., 2002). Counselor educators have been encouraged to embrace technology and take full advantage of what it offers in classroom application (Karper et al., 2005; Quinn et al., 2002), in both traditional face-to-face classrooms and in online classes (Glass, Daniel, Mason, & Parks-Savage, 2005). Counselor educators have integrated educational technologies such as course web sites, PowerPoint, video clips, videoconferencing, and videotaping in both traditional and online classrooms (Baggerly, 2002). Recently, Web 2.0 technologies such as 3-D worlds, web conferencing, blogs, Wikis, podcasts, and vodcasts have gained popularity in some counselor training programs (Rockinson-Szapkiw & Walker, 2009), though additional training may be needed to familiarize counselor educators with best practices for their use.

In order to increase their ability to integrate technology in the teaching process, counselor educators may have to seek training in technology outside counseling departmental resources (Glass et al., 2005) to better use "web-based applications, Web-CT, e-mail, Internet, on-line courses, Blackboard, distance learning, listserv, and on-line library resources" (Bachus, 2006, p. 139). Counselor educators do not have to possess expertise in all the technology competencies proposed by the ACES Technology Interest Network, but they should know where on campus to get help and training (ACES, 2007).

Online course delivery in counselor education provides one of the more challenging venues for technology integration in the field, and guidelines now exist to assist counselor educators in providing quality online instruction (ACES, 1999a).

The ACES (1999a) Technology Interest Network created 27 guidelines for online instruction in counselor education. The guidelines address course quality, course content and objectives, instructional support, faculty qualifications, instructor and course evaluation, technological standards, and grievance procedures. Online counselor education courses should be equal to traditional face-to-face courses in terms of information offered, skill building, and course evaluation. Research is needed to evaluate the effectiveness of these guidelines and the level of awareness and use by counselor education programs. Perhaps adoption and integration of the guidelines into mainstream core requirements of the primary counselor education accrediting organization could make the guidelines more accessible and useful for counselor education programs.

The Council for Accreditation of Counseling and Related Educational Programs (CACREP) has not adopted specific standards for counselor education programs regarding technology integration at the institutional level. Technology appears only twice in the 2009 standards. The first is under Section II/Professional Identity/Knowledge/F: "Evidence exists of the use and infusion of technology in program delivery and technology's impact on the counseling profession" (CACREP, 2009, p. 10). The second falls under Career Counseling/L/3, which calls for students preparing to become career counselors be able to "[demonstrate] the ability to train others in the appropriate use of technology for career information and planning" (CACREP, 2009, p. 28). The accrediting body for counseling programs may need to integrate specific goals and objectives in the next revision of standards in order to help communicate the need for technology integration at all levels of counselor education.

Technologically competent counselor educators may need to recommit to the advancement of the counseling profession by helping counselors see the need for technology as a necessary work tool and by increasing counselors' awareness of productivity gains to be achieved through technological competence (Chandras, 2000). Counselor trainees need an understanding of how technology affects persons on all socioeconomic levels and in all cultural communities (ACES, 2007; Chandras, 2000). Such an understanding undoubtedly requires that counselor educators have a high level of technological competency on a personal level. However, the gap in the understanding of the status of counselor educators' technological competence precludes the creation of any plan of action to improve the situation. Even the technology skill standards proposed by the ACES (1999b) Technology Interest Network in 1999 and expanded in 2007 have yet to be adopted by the counselor education community at large (Quinn et al., 2002).

In a study of the 146 CACREP-accredited programs existent in 2002 (Quinn et al., 2002), only 11 out of the 44 respondents indicated that their school's counselor educators could meet the ACES (1999b) Guidelines for Technical Competencies for Students. With so few counselor educators meeting the requirements placed on students, one can see the need for research into the factors that influence how technological innovations reach the attention of counseling educators, how counselor educators decide to explore and to learn about technological innovations, and how counselor educators adopt, or fail to adopt, the technology into the classroom. Clarification of the nature and extent of barriers to learning technology, gaining technology literacy, and integrating technology in the classroom would provide much needed guidance for improving technology competency in counselors and counselor educators.

Barriers to technology integration.

Barriers to successful adoption and implementation of an innovation can exist at both individual and organizational levels. Evidence exists concerning factors that can hinder or help individuals and organizations deal with changes needed for successful integration of new technology. Such factors include "understanding the need for change, the level of organizational support and training, assessment of the change, positive experience and informal support, the organization's history of change, individual's prior outlooks, and individuals' feelings and expectations" (Becker, 2010, p. 251). This evidence may help redirect much of the blame for the lack of technology integration in education, which has previously gone to educators in the classroom (Cuban, 1986). Educational and professional organizations encounter barriers to acceptance and integration of technology in much the same way as individuals.

An organization's process of adopting an innovation may fail because of two powerful forces: organizational defensive routines and organizational memory. Preexisting beliefs, experiences, procedures, memories, and routines of an educational system must often be "unlearned" as part of the change process involved in adoption of technology (Becker, 2010). Gieskes and Hyland (2003) described the development of organizational defensive routines, or sets of beliefs and behaviors, that inhibit successful implementation of innovations within organizations. The inertia created by the organization's defensive routines "inhibits change and prevents unlearning" (Becker, 2010, p. 253). Organizations also seem to have "organizational memory" that encourages learning from experience; however, the same memory can also limit the organization's ability to create or search for future alternatives due to past experiences with innovation (Berthon, Pitt, & Ewing, 2001). Changes in an organization's beliefs and patterns of behavior take place very slowly over time—not at the time a new technology is adopted (Becker, 2010). Applied to education as an institution, preexisting negative attitudes toward technology in the classroom, or memories within the institution of past failed attempts to change the teaching and learning process using some technological innovation, may be to blame for failed attempts at technology integration in the classroom. The language used to describe failed attempts at technology adoption and integration can perpetuate nonhelpful attitudes toward learning technology.

In an effort to encourage counselor educators to recognize the importance of their role in helping decrease "negative attitudes and anxiety that may stand in the way of students appreciating the innovative potential computers can have on the process of learning" (Jencius & Paez, 2004, p. 84), "current counselor resistance to technology" (p. 81) was compared "to historic resistance to technology" (p. 81). Jencius and Paez (2004) described similarities between technology-resistant counselors and the Luddites, a group of textile workers in 19^{th}-century England who opposed technological innovation in the textile industry. Labels such as Luddites (Jencius & Paez, 2004), late adopters, and laggards (Rogers, 2003) may carry objectionable connotations for counselors who are either technology resistant or who view themselves as unable to learn new technology.

Such metaphorical perspectives may highlight the negative aspects of failing to adopt technological innovation; however, just as all metaphors and ways of thinking obscure something (Rosenblatt, 1994), this metaphor obscures positive reasons for not adopting technological innovation such as the propensity of technological adoption to reduce quality of life of users (Chesley, 2005). In other words, some counselors and counselor educators may avoid technology integration because it makes work more difficult or time-consuming. For example, adopting communication technologies, such as cell phone use, has been linked to greater boundary permeability between work and family life, and this increased permeability in boundaries seemed "to favor the transfer of negative [consequences], rather than positive [benefits]" (Chesley, 2005, p. 1245). Often, the question of whether to adopt technological innovations involves the outcome: Is the user better off in the long term (Casey, 2000)? The process of technology adoption and integration continues to grow in complexity and number of influencing factors, both intrinsic and extrinsic in nature. In counselor education, teachers encounter individual and institutional factors affecting their level of technology integration.

Individual factors affecting technology integration.

Research into the effect of individuals' differing characteristics on the diffusion and adoption of ICT increased during the 1990s (Thatcher & Perrewé, 2002). Individual characteristics of computer users refers to personality, personal innovativeness (Agarwal & Prasad, 1998a, 1998b), age (Inan, 2007; Inan & Lowther, 2010; Massoud, 1991), gender (Loyd & Gressard, 1986), and other demographic variables (Agarwal & Prasad, 1998b; Inan & Lowther, 2010) attributable to individual users of ICT. This research study explores teacher age, years of teaching experience, counselor educator preparation for computer use, and educators' confidence and comfort using computers as the individual factors affecting technology integration. The next section describes the rationale for inclusion of these variables in the study.

Demographic characteristics of educator.

Much of the blame for the lack of technology integration by educators has fallen on educators themselves (Cuban, 2001). Many times, the topic of age appears on the list of influences on technology use by teachers (Inan & Lowther, 2010; Matthews & Guarino, 2000; Meyer & Xu, 2009; van Braak et al., 2004). In a review of the literature from the past two decades covering older and younger adults' attitudes toward and abilities with computers, Broady, Chan, and Caputi (2010) reported the existence of "conflicting results about older users' computer attitudes and computer training outcomes" (p. 473). They found the most common belief about older adults and computer use has been that older adults have more negative attitudes and experiences with computers than do younger users.

Broady et al. (2010) cited studies in which age seemed to have "little to no impact on attitudes towards computers" (p. 474). A 1988-1989 study of 587 elementary and secondary teachers from 60 schools across five urban school districts in southern California explored demographic differences between elementary teachers and two groups of secondary teachers (Rosen & Weil, 1995). The study was used to explore the relationship between computer availability and computer use by teachers, as well as levels of technophobia in teachers and effective models that could be used to predict technophobia. The three groups of teachers compared in the study—elementary teachers, secondary science teachers, and secondary humanities teachers—exhibited no correlation between teacher age and computer use (Rosen & Weil, 1995). The study results suggest that age has no effect on teachers' technology integration; however, other evidence indicates that teacher age and years of teaching experience directly and indirectly affect teachers' computer use and their technology integration in the classroom (Inan & Lowther, 2010).

Matthews and Guarino (2000) studied the effect of gender, academic degree, years of teaching experience, and school level, along with computer literacy and computer ability, on teachers' computer usage in the classroom. Years of teaching experience was inversely related to computer literacy and computer ability (Matthews & Guarino, 2000). In other words, the teachers with the most experience reported having lower levels of computer literacy and computer ability. Age considered in combination with other individual characteristics can affect attitudes and behaviors regarding technology and its integration in education. For example, stress and age may play a role in the failure of many older counselor educators' adoption of technological advances (Chandras, 2000). Other demographic differences seem to affect computer use by teachers.

Race, gender, and experience with computer use may affect technology use by educators, and combinations of these and other individual characteristics can have varying effects on technology use (Meyer & Xu, 2009). Regarding race, Rosen and Weil (1995) reported that more White elementary teachers used computers with students (71%) compared to non-White elementary teachers (47%), and more White secondary humanities teachers in the study (36%) used computers with students than did their non-White peers (18%). Gender was related to computer use only for the group of secondary science teachers, and ethnicity affected computer use by elementary teachers and secondary humanities teachers (Rosen & Weil, 1995). Clearly, research does not seem to provide a definitive answer on the relationship between age and computer use by teachers; however, age and other demographic characteristics do play some role in how counselor educators learn technology.

Counselor educator preparation for computer use.

Training for faculty and students in classroom technologies may seem to be a given (Wantz et al., 2004); however, even counselor educators who have received training may feel intimidated by the complexity of instructional technology (Karper et al., 2005). Little incentive often exists for educators to learn new technologies because teacher evaluations rarely include technology skills assessment as part of the teacher evaluation process (Whale, 2006). Still, studies have indicated that both preservice and experienced educators benefit from technology training (Howland & Wedman, 2004; Inan & Lowther, 2010; van Braak et al., 2004). Training in use of new and existing technology can improve teachers' attitudes toward technology use and increase their integration of technology in their teaching practices.

G. Watson (2006) studied 389 K-12 teachers in West Virginia who participated in in-service professional development training on integration of the Internet into math and science curriculum. All the teachers attended a 5-day intensive training program offered during the summer, but teachers received the option of attending an optional fall and spring online course. Overall, all teachers reported an increased level of computer self-efficacy regarding integration of the Internet in their classrooms, and the levels remained high years later (G. Watson, 2006). The largest increase in self-efficacy occurred for teachers who also attended the optional online courses. An increase in self-efficacy can enhance the learning process for teachers as students of technology. One-on-one mentoring and more training may increase teachers' technology integration (Zhao & Bryant, 2006).

The learning process counselor educators use when learning technology can be a factor just as influential as the content of technology training. For example, counselor educators take on many roles in the counselor training process. One such role is that of supervisor. As part of the supervision training process, counselors develop skill in recognizing and using isomorphism. In counselor education and supervision, transacting parts of the counseling training system, supervisor-therapist-client, recursively replicate patterns of content and process across the system and subsystems through a process known as *isomorphism* (Liddle, 1988). Thus, the interaction pattern between client and therapist may be reflected in the interaction pattern between therapist and supervisor.

Counselor educators, as transacting members of the technology training system, need skill to develop awareness of isomorphism within the learning, using, and teaching of technology. Counselor educators, for example, participate as learners, users, and teachers of technology. The content, or *what* they learn about technology, influences what technologies counselor educators use or teach to students. In other words, counselor educators can help eliminate negative attitudes and anxiety of students regarding technology use and thus free them to appreciate the impact of technology on the learning process (Jencius & Paez, 2004). Counselor educators' process of learning technology influences the way they integrate technology in teaching students. When counselor educators exhibit confidence and comfort using computers, students have a good opportunity to learn through isomorphism.

Confidence and comfort using computers.

Students' confidence and comfort in using computers is closely related to computer self-efficacy (Thatcher & Perrewé, 2002), and the same is true for educators (Abbitt & Klett, 2007). Computer self-efficacy is one's perception of one's capabilities related to specific computer skills and knowledge (Moos & Azevedo, 2009). The concept of self-efficacy derives from the work of Bandura (1997) in social cognitive theory, which describes how learning takes place as a result of the interaction of "environmental, behavioral, and personal influences" (Moos & Azevedo, 2009, p. 578). A strong, positive relationship exists between self-efficacy and learning (Bandura, 1997). For example, as students' self-efficacy in using computers increases, their confidence and comfort with computers also increases. This well-researched relationship (Moos & Azevedo, 2009) suggests that counselor educators who feel more confident in their ability to use computers may tend to integrate computers into their teaching. At the least, self-efficacy can lead to more positive attitudes toward technology integration.

Counselor educators' learning experiences as students of technology during their professional development as counselors and educators shape their self-efficacy, confidence, and comfort in using technology. Effective integration of technology in the counselor education process requires an initial understanding of counseling students' attitudes toward technology (Jencius & Paez, 2004). Technology itself may be perceived by counseling educators as an unwelcome encroachment (Quinn et al., 2002), and negative attitudes toward technology by counseling students can often result in computer anxiety, which can inhibit students' learning (Massoud, 1991). Negative attitudes toward technology may also show up as negative attitudes toward the integration of technology in the classroom.

Technophobia, or computer phobia, describes an individual's fear of using technology or a computer (Loyd & Gressard, 1986). Possible contributing factors to a fear of computer use include lack of experience with using computers (Loyd & Gressard, 1986) and previous negative experiences in computer use (Jahromi, Lavasani, Rastegar, & Mooghali, 2010). Motivation and achievement goals can serve as mediating factors between students' attitudes or beliefs and anxiety in regard to computer use (Jahromi et al., 2010). In a study of 375 undergraduate students, Jahromi et al. (2010) reported that students who set performance or mastery goals when working with a task involving computers often experienced cognitive and emotional reactions that increased their motivation to accomplish the task, and the task became more attractive to the students. Positive attitudes toward computers and technology can serve as a moderator between computer anxiety and stress (Parayitam et al., 2010), and a reduction in stress can lead to more positive learning experience using technology. Teachers' attitudes toward computers and technology serve to mediate the indirect effects of individual and institutional-level factors on technology integration (Inan & Lowther, 2010).

Institutional-level factors affecting technology integration.

Institutional-level factors explored in the current study include number of computers available in the classroom for instruction, general school support for computer use, and technical support (Hogarty, Long, & Kromrey, 2003). Few studies have explored the impact of individual and school-level factors on technology integration (Tondeur, Valcke, & van Braak, 2008).

Availability and access to computer resources.

Integration of computers in education requires adequate availability of and access to computers. Educators may possess technological competency and a desire to integrate computers in the classroom; however, integration remains an impossible task if students and teachers do not have a sufficient quality and quantity of computers available (Lowther et al., 2003). Proponents of educational technology tout improved accessibility to computers as means of improving student learning (Hannafin et al., 2005); however, little support exists for the belief that making ICT accessible to teachers improves instructional quality or improves students' academic performance (Inan & Lowther, 2010). Research seems to indicate that the number of computers available in the classroom is a strong predictor of educators' technology integration (Matthews & Guarino, 2000). The availability and access to computers in school often rests within the control of school administration, leaving teachers at a disadvantage when they do not have institutional-level encouragement and technical support for technology in the classroom.

School administrative and technical support.

In higher education, faculty satisfaction influences successful integration of educational technology, and an instructor's level of satisfaction in the online teaching environment seems to depend somewhat on the level of value of and support for online teaching by the school (Wasilik & Bolliger, 2009). Overall support from the school and technical support positively influence teachers' beliefs about computer use (Inan & Lowther, 2010). Without support, educators must be self-supporting in their efforts to integrate technology in the classroom. Faculty often find the most helpful support comes from colleagues (Lin & Chiou, 2008; Sahin & Thompson, 2007). Collegiality and peer interactions help create a supportive learning environment for teachers needing support in learning to integrate technology (Nicolle & Lou, 2008). Thus, the level of support for technology use serves as an institutional-level factor affecting technology integration. This study explores the interactive effects of individual and institutional-level factors presented on counselor educators' integration of technology in the classroom.

Measuring technology integration in counselor education.

Understanding the process of technology integration by educators requires a recursive view of individual, organizational, pedagogical, and technological variables that extends beyond a simple examination of such variables in isolation (Levin & Wadmany, 2008). The number and diversity of instruments proposed to assess technology integration in education provides evidence of the difficulty researchers have encountered in measuring the complex phenomenon (Hogarty et al., 2003). Most instruments seem to investigate attitudes toward computer use, specifically computer anxiety. Assessing the "psychological impact that computers and technology have on individuals" (p. 535) requires an instrument capable of accurately assessing attitudes towards computers (Morris, Gullekson, Morse, & Popovich, 2008). Many factors exert influence on educators as they decide to integrate or not to integrate technology in their teaching practices, and exploring these factors is a complex process.

CHAPTER II

RESEARCH METHODS

This study focused on counselor educators' individual factors and institutional-level factors influencing their integration of technology in the classroom. This section of the research provides a description of the research methodology for the study, including definitions of terms, research questions, hypotheses and statistical analysis, and procedures for data collection and analysis. The section also includes a discussion of path analysis, which was used to explicitly examine causal pathways between the variables in order to provide an estimation of the "relative importance of alternative paths of influence" (Olobatuyi, 2006, p. 11).

Definition of Terms

Definitions for the following terms have been adopted from the literature reviewed in order to facilitate a common foundation for the constructs described in this research study.

Adoption. In discussing technology integration in counselor education, adoption refers to "[A] decision to make full use of an innovation as the best course of action available" (Rogers, 2003, p. 37).

Confidence and comfort using computers. Computer users' confidence in using computers refers to their self-reported competence and belief in their current ability to use computers effectively. Attitudes toward computer use, such as anxiety and liking, related to using computers in education (Massoud, 1991) are considered as distinct from confidence and comfort in using computers. "In addition, this factor [is] defined by items suggesting the effective use of computers, the development of expertise, and the comfort with giving computer assignments to students" (Hogarty et al., 2003, p. 151).

Counselor educators' technology integration. Integration of computers in education involves the use of computers as problem-solving/decision-making tools for individual and group instruction in ways that promote both independent and student-centered learning (Hogarty et al., 2003); thus, counselor educators' integration of technology describes the use of computers in such ways within the counselor education learning environment. For purposes of this study, technology integration refers to the use of ICT for instructional preparation, for instructional delivery, and as a learning tool (Inan & Lowther, 2010), whether in the face-to-face, online, or blended counselor education environment.

Educational technology. Educational technology "includes all the components of an integrated system necessary for appropriately using tools and equipment for educational purposes" (Bates & Poole, 2003, p. 6) and "encompasses any means of communicating with learners other than through direct, face-to-face, or personal contact" (Bates & Poole, 2003, p. 5). Components include hardware, software, and infrastructure for information systems; human skills and support needed to create, develop, select, and implement the technology; and the "organization required to enable the tools and equipment to be developed and used appropriately" (Bates & Poole, 2003, pp. 5-6).

Endogenous variables. These are variables in a path analysis model with values that can be explained by one or more of the other variables (Klem, 1995; Stage, Carter, &

Nora, 2004). In the path diagram, endogenous variables would have one or more arrows pointing to them from the other influencing variables (Klem, 1995; Mertler & Vannatta, 2005).

Exogenous variables. Variables in a path analysis equation with values that cannot be explained by the other variables in the mathematical model (Klem, 1995). "In a path diagram, an exogenous variable is linked to other exogenous variables by two-headed, curved arrows and to endogenous variables that it affects by straight arrows" (Klem, 1995, p. 94).

Information and communication technology (ICT). Information and communication technology has been used often in the literature without definition (e.g., Mumtaz, 2000; Orlando, 2009; Sang, Valcke, van Braak, & Tondeur, 2010; Tondeur et al., 2008). For this study, ICT in education refers to the management and transmission of information using electronic technology such as computer hardware and software, network infrastructure, telephony and data communications networks in order to improve communication.

Innovation. "An idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12).

General school support for computer use. "This factor [is] defined by items concerned with encouragement on the part of the administration and faculty, administrative support for computer-related training, and a sufficient level of access to computers at school" (Hogarty et al., 2003, p. 149).

Path analysis. A "special case of covariant structure analysis" (Klem, 1995, p. 65) stemming from multiple regression (Mertler & Vannatta, 2005) that seeks "to provide estimates of the magnitude and significance of hypothesized causal connections among sets of variables displayed through the use of path diagrams" (Stage et al., 2004, p. 5). "Path analysis allows a researcher to test a theory of causal order among a set of variables" (Klem, 1995, p.65).

Personal use of computers. The use of computers by educators for personal purposes not relating to education, including using computers as research tools, productivity and communication tools, and as entertainment and recreational tools (Hogarty et al., 2003).

Teacher preparation for computer use. An individual-level factor in this study that describes the ways teachers actually received training and their perceptions on the potential effectiveness of training in introductory computer skills, use of specific computer applications, and specialized training on integrating technology into the classroom (Hogarty et al., 2003).

Technical support. "An institutional-level factor encompassing "assistance in problem solving and trouble shooting and help with techniques to integrate computer technology into the classroom" (Hogarty et al., 2003, pp. 150-151).

Technological competency. This describes the skills and observable behaviors counselors can demonstrate or do with technology (Sabella et al., 2010).

Technological literacy. Tyler and Sabella (as cited in Sabella et al., 2010) defined technological literacy as "[t]he intellectual processes, abilities and dispositions needed for counselors to understand the link among technology, themselves, their clients, and a diverse society so that they may extend human abilities to satisfy human needs and wants for themselves and others" (p. 610).

Research Questions

This study explored the fit of a proposed research-based model describing causal effects among the following variables: ounselor educators' preparation for computer use, confidence and comfort using computers, general school support for computer use, technical support, availability of computers for instruction, attitudes toward computer use, and counselor educators' integration of technology in the classroom. A hypothesized path model was proposed, and the study investigated the fit of the model with the observed correlations among the variables. The model was consistent with the observed correlations among the variables; therefore, the study estimated direct, indirect, and total causal effects among the variables, assessed the fit of the model to the data, and offered a parsimonious model for further research (Mertler & Vannatta, 2005). Regression analysis was used to estimate unidentified relationships among the variables.

In path analysis, research questions take the form of a path diagram. Some of the questions explored during the process of path analysis included:

- Do counselor educators' demographic characteristics influence their technology integration?
- Do counselor educators' attitudes toward using computers, preparation for computer use, and confidence and comfort using computers influence their technology integration?
- Do institutional-level characteristics influence counselor educators' technology integration?
- How effective is the proposed research-based model in describing counselor educators' integration of technology into the classroom?

Statistical Analysis

In researching the adoption and use of technology by individual users, the survey method has been the predominant research methodology used (Choudrie & Dwivedi, 2005). At the organizational level, case studies have been most often selected as the methodology of choice. This study focuses on how counselor educators integrate technology used the survey method to collect data from a sample of counselor educators; however, analysis of the survey involved path analysis in order to understand the relationships between individual counselor educator characteristics, institutional variables, and counselor educators' technology integration. Path analysis tests the hypothetical relationships between the variables, thereby testing individual hypotheses represented in graphical form as a path diagram (Klem, 1995).

An extension of multiple regression (Lea, 1997; Mertler & Vannatta, 2005; Stage et al., 2004), path analysis was first developed in the 1920s as a way to investigate causal patterns among a set of variables (Klem, 1995; Lea, 1997; Olobatuyi, 2006). Path analysis permits exploration of the flow of effect, both direct and indirect, within the variables under study (Mertler & Vannatta, 2005; Stage et al., 2004). The process begins with the formulation of hypotheses concerning the causal relationships among a set of variables (Klem, 1995). The researcher then articulates the theory as a model, in written and diagrammatic form, using single- or double-headed arrows to indicate the expected directionality of correlations among variables (Klem, 1995; Mertler & Vannatta, 2005). The path diagram flows from left to right according to time (Sprinthall, 2007) and functions as a concise representation of the research hypotheses concerning the variables being explored (Klem, 1995).

Rather than referring to variables under study as dependent or independent variables, researchers classify variables as *endogenous* or *exogenous* (Mertler & Vannatta, 2005). Endogenous variables are those that are "affected by one or more other variables in the model" (Klem, 1995, p. 93). In the path diagram, endogenous variables would have one or more arrows pointing to them from the other influencing variables (Klem 1995; Olobatuyi, 2006). Two-headed, curved arrows indicate links from one exogenous variable to another, while straight arrows are used to indicate links from an exogenous variable to an endogenous variable it affects (Klem, 1995).

The goals of path analysis are "to provide estimates of the magnitude and significance of hypothesized causal connections among sets of variables displayed through the use of path diagrams" (Stage et al., 2004, p. 5) and to offer an opportunity to test the model's consistency with the observed data in order to accept or reject the model's plausibility (Klem, 1995, p. 67). The initial input path diagram shows the independent, intermediate, and dependent variables, including connecting arrows indicating the expected relationships between the variables (Lea, 1997). This initial path diagram will be refined based on the actual findings of the research, resulting in the creation of an output path diagram (Lea, 1997).

Assumptions and limitations.

Path analysis is a specific application and extension of multiple regressions; therefore, it requires similar underlying assumptions (Klem, 1995), including linearity and additivity, interval level of measurement, measurement error, homoscedasticity, lack of auto correlation, lack of multicollinearity, normality, specification of error, recursiveness, error terms and independent variables are uncorrelated, and identification

(Olobatuyi, 2006). Path analysis has several limitations. Path analysis does not establish directionality of causality (Lea, 1997; Olobatuyi, 2006) and can only be used to test a clear hypothesis or a single-path diagram representing only a few hypotheses (Lea, 1997). If feedback loops are present in the hypotheses, path analysis is contraindicated, as the causal pathway must progress across or down the input-path diagram (Lea, 1997).

All relationships depicted in the path diagram must be testable using multiple regression (Lea, 1997; Olobatuyi, 2006), and data must be measurable on an interval scale because all the model's variables must serve as dependent variables in multiple regression analyses (Lea, 1997). "Another drawback of path analysis is that it does not permit the possibility of a degree of interrelationship among the residuals associated with variables used in the path model" (Stage et al., 2004, p. 12). Researchers have not agreed on a common interpretation of path coefficients, with some arguing that path coefficients represent the "fraction of the standard deviation of the dependent variable explained by the independent variable, but others have interpreted it as the proportion of the variance in the dependent variable directly accounted for by the independent variable in question" (Olobatuyi, 2006, p. 8). Because path analysis uses correlations among variables, it can never prove causality; however, it can "fail to be disconfirmed" (Kline, 1991, p. 476).

Hypothesized path model.

The hypothesized path model used in the study was based on an integration of several previously studied path models designed to explain technology integration by teachers in K-12 classrooms (Inan, 2007; Inan & Lowther, 2010; Matthews & Guarino, 2000; Meyer & Xu, 2009; van Braak et al., 2004). The model organizes study variables into four columns. The first column contains two exogenous educator demographic variables—counselor educator's age and years of teaching experience. The second column contains three exogenous institutional-level variables—general support for computer use, technical support, and availability of computers. The third column of variables in the model contains three individual educator-level factors—counselor educator confidence and comfort using computers, counselor educator preparation for computer use, and counselor educator attitudes toward using computers. These three endogenous variables function as intervening variables in the model and mediate the indirect effects of the exogenous variables on the outcome variable (Olobatuyi, 2006), in this case counselor educators' technology integration in counselor education. The final group contains only the endogenous variable counselor educators' technology integration in the classroom, which is measured by three sections of the survey instrument: types of software used by the teacher/student to complete school-related activities, integration of computers into the classroom, and teacher's personal use of computers (Hogarty et al., 2003).

Technology was used to refer to computers, software, infrastructure, Internet use, and other technology used in educational settings. The main representation of technology in the classroom, whether face-to-face, online, or hybrid, is the computer; therefore, the terms *computer* and *technology* are used interchangeably in this study. Table 2 provides a list of study variables accompanied by descriptions for the hypothesized path model in Figure 1. Self-report measures provide observed values for all study variables.

Table 2

Description of Variables

Variables	Description (measured via self-report)
Teacher's age*	Age of counselor educator in years
Years of teaching*	Number of years teaching in higher education
General support for computer use*	Support for computer use by faculty and administration
Technical support*	Teacher access to on-site technical specialist(s)
Availability of computers*	Number of computers available for instruction
Confidence and comfort using computers**	Perceived level of competence and comfort in using computers in the classroom
Teacher preparation for computer use**	Perceived level of training and experience in using computers
Attitudes toward computers**	Teacher' attitudes toward use of computers in the classroom in general
Technology integration**	Use of technology by teachers in the classroom (face-to-face, online, or hybrid/blended formats) as measured by: • Types of software used by the teacher to complete school-related activities • Types of software used by students to complete school-related activities • Integration of computers into the classroom • Teacher's personal use of computers

*Indicates exogenous variables.
**Indicates endogenous variables.

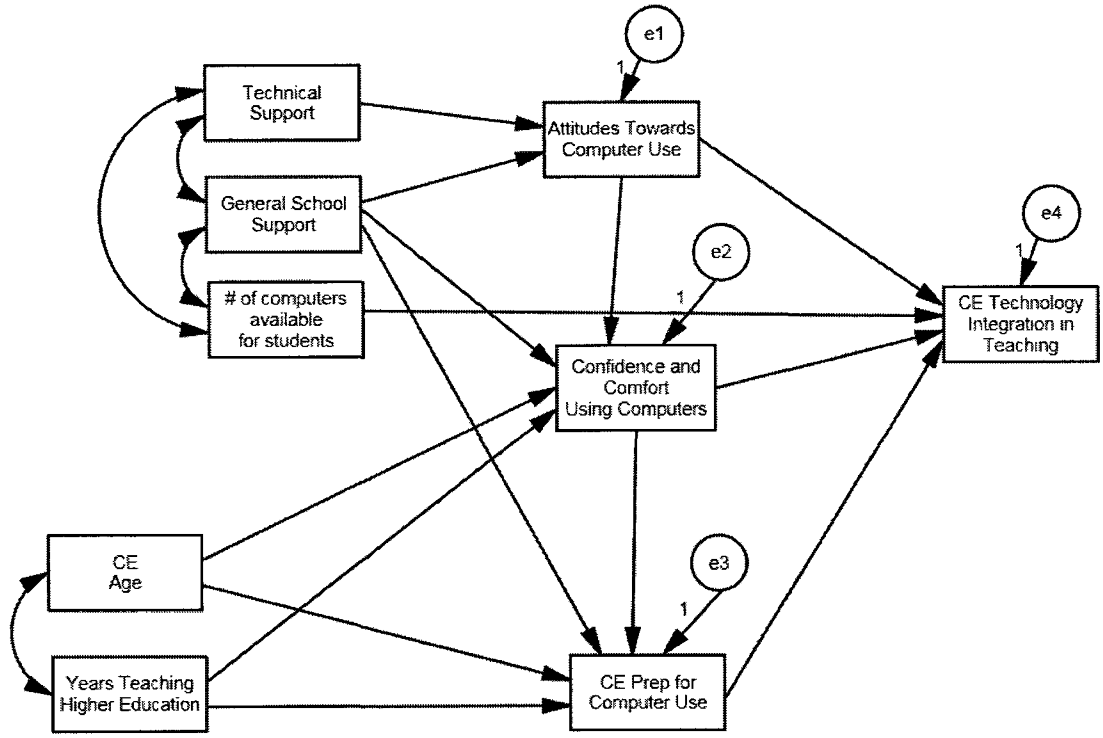

Figure 1. Hypothesized path model.

A hypothesized path model provides research hypotheses in graphic form. The effects of all study variables, both direct and indirect, on counselor educators' technology integration in teaching were estimated through a series of multiple regressions. Once bivariate correlations were obtained for all variables, they were used to test the proposed model's fit to the data. The effects of the exogenous variables on each of the four endogenous variables were estimated through multiple regression of each endogenous variable on the exogenous variables in preceding paths indicated by unidirectional arrows in the path diagram.

Procedures

The principal investigator (PI) received a research award to cover the cost of obtaining the e-mail addresses of potential participants from the ACA and to offset the expense of a professional-level subscription to SurveyMonkey.com. The PI agreed to acknowledge receipt of the research award from the Southern Association for Counselor Education and Supervision (SACES) in all publications and presentations conveying the results of the study. The PI completed training regarding conducting research involving human subjects, and the study received approval from Regent University's Human Subject Review Committee (see Appendix A).

Data sources.

Any counselor educator currently teaching in a CACREP or non-CACREP accredited counselor training program was eligible to participate in the study. Participants needed to be at least 18 years of age and currently teaching in an undergraduate, master's, or doctoral counseling-preparation program in order to be eligible for inclusion in this study. The goal was to recruit 250 counselor educators to complete the online survey instrument. The statistical procedures used required a suggested minimum sample size of 10 to 20 complete surveys for each of the nine study variables. The goal was to obtain around 180 complete responses.

Participants for the study came from two main sources. Separate data collectors were established online in SurveyMonkey.com to gather responses from each of the two data sources. The CESNET-L listserv provided the first source for qualified participants. An invitation to participate, including informed consent, went out to 1,697 subscribers comprised of counselor educators, counselor education students, and individuals interested in counseling education-related discussion topics. After a follow-up reminder 1 week later, 50 participants had submitted at least a partial response to the online survey.

The second source for participants came from a list of ACES membership list. Permission was obtained to use the rented list to contact list members regarding participation in the study. Representatives of ACES granted permission and contacted ACA membership services to prepare the list. Two Excel spreadsheets were obtained, one that included a filtered list of names containing only those ACA members who had identified themselves as counselor educators in their membership profile (N = 889). The larger list (N = 2,160) contained counselor educators, counseling students, and other ACES members. Use of the larger database offered an opportunity to reach more potential participants and improve the probability of reaching a larger number of counselor educators because some members may not have indicated identification as a counselor educator in their individual ACA membership profile. Another 447 e-mail addresses of counselor educators gathered from an online search of counselor education programs across the country were added to the ACES membership list. A final edit to delete any duplicate e-mail rendered a list of 2,607 potential recipients of the survey invitation.

An initial e-mail invitation went out (see Appendix B), followed by a second invitation 1 week later, resulting in 54 partial responses and 210 complete responses. The responses obtained from the CESNET-L listserv collector and the ACES membership e-mail list collector formed the initial pool (N = 344) of participants for the study. Informed consent (see Appendix C) was included in the solicitation e-mails and as the first page of the online survey. Participants were required to affirm their understanding of the study's nature and purpose in order to participate in the study.

Instrumentation.

An adaptation of the Perceptions of Computers and Technology (PCT) survey (Hogarty et al., 2003) was used to measure the study variables. Permission obtained for adaptation and use of the survey in the current study is included in Appendix D. The questionnaire contained 106 items covering five domains: counselor educators' demographics, technology integration, confidence and comfort using computers, support of computer use, and attitudes toward computer use. Participants responded to the survey questions online using a link provided in an e-mail solicitation. Based on initial pilot testing, the survey took 15 to 20 minutes to complete.

The PCT served as an effective measure of critical factors affecting technology use in schools (Hogarty et al., 2003). The instrument underwent large-scaled field testing and validation of the scores through factor analytic and correlational methods (Hogarty et al., 2003, p. 141). The original survey instrument categorized critical factors in technology integration according to broad domains: integration, teacher confidence and comfort using computers, support of computer use, and teacher attitudes toward computer use. The items in the original survey were adapted from existing validated instruments in each of the four domains being researched (Hogarty et al., 2003).

The *integration* domain includes items designed to measure strategies used by individual teachers in the classroom, types of software applications used by teachers and students, and personal use of computers by teachers. Under *teacher confidence and comfort using computers*, survey items explore teachers' preparation for computer use and their confidence and comfort using computers. The third domain, *support of computer use*, includes items to assess general school encouragement and support for computer use, along with questions about technical support resources. The final domain, *attitudes toward computers*, measures "general attitudes regarding the use of computers in the classroom" (Hogarty et al., 2003, p. 142). Based on factor analyses within each domain of the original survey instrument, coefficient alpha values ranged from .74 to .92, indicating acceptable reliability (Hogarty et al., 2003, p. 158). The unadapted survey instrument had been tested on teachers from elementary, middle, and high schools, and correlations "between instrument subscales and relationships with external variables provide[d] some initial support for the validity of the scores" (Hogarty et al., 2003, p. 158). Validity scores obtained using the adapted survey instrument in the current study ranged from .62 to .90. The adapted survey instrument appears to have similar levels of validity each of the domains explored.

Data collection and analysis.

This study used SurveyMonkey.com as the primary data collection method. In a validation study of the PCT, Hogarty et al. (2003) investigated "potential differences in responses collected via paper-and-pencil surveys and Web-based survey methods" (p. 140). The expectation was that by using the two different survey collection methods, any confounding relating to data collection methodology, such as disparity in Web access, could be mitigated. Results indicated statistically significant differences between the response rates for Web-based and traditional paper-and-pencil surveys; however, no "statistically significant differences were observed between the paper mode and Web mode regarding either gender or racial representation in responding" (Hogarty et al., 2003, p. 159). Only 250 responses were sought for the current study; therefore, the online survey version was selected for ease of administration and data analysis.

The online survey remained available for a 10-day period, and the survey collectors were closed after obtaining 344 responses. Survey responses were transferred into SPSS, Excel, and AMOS for statistical analysis. The analysis of the data and hypothesized path model involved validating the model's adherence to statistical assumptions applicable to multiple regression (Lea, 1997; Olobatuyi, 2006) and checking for multicollinearity issues with the variables (Inan & Lowther, 2010; Stage et al., 2004). The data were screened prior to statistical analysis.

CHAPTER III

RESULTS

This chapter describes the data analysis procedures, including characteristics of the respondent sample, pre-analysis data screening procedures and preliminary analysis of data for adherence to assumptions for multiple regression and path analysis. The estimated path model is presented, along with a parsimonious path model. This section of the study concludes with a summary of findings.

Pre-Analysis Data Screening

Excel and SPSS versions of the raw data were compared to check the accuracy of the file structure of the SPSS download from Surveymonkey.com. An analysis of the responses to each question resulted in the deletion of several participants' data. Of the 344 responses to the survey, 36 responses were deleted because they were incomplete beyond the initial demographic questions, 14 were discarded due to a lack of response to the questions on technical support, and 41 others were not used because they did not provide a complete set of responses to the final sections of the survey. After deleting these three groups of responses ($N = 91$), 253 complete or mostly complete responses remained. The PI conducted an analysis of remaining values using SPSS 19.0. Of the 26,818 possible data values (253 respondents x 106 survey items), 1.38% ($N = 370$) were randomly missing. Of these, 126 missing values were replaced with the mean for each corresponding question (Mertler & Vannatta, 2005), rather than selecting pairwise or listwise exclusion for regression and path analyses. The remaining 244 missing values were recoded as "N/A" because they were connected to specific survey items asking about online teaching, and an analysis of these items revealed that the majority of survey respondents who failed to provide a response to these questions had also indicated their teaching mode was exclusively or mostly face-to-face. The final data set therefore consisted of 253 complete responses collected from the 344 initial responses.

Two concerns arose in the pre-analysis data screening that may have a significant effect on the results. First, the survey item designed to measure *number of computers available in the classroom for instruction* failed to differentiate between face-to-face classrooms and online environments. For example, counselor educators who indicated a face-to-face teaching modality were able to estimate the number of computers available in the classroom; whereas, educators teaching online seemed to have experienced confusion in how to respond to the question. Because the study was not designed to explore differences in teaching modalities, the PI decided to continue the data collection process as planned. The cost of obtaining another sample seemed to outweigh the hypothesized contribution of the specific question to the proposed path model's fit. The inclusion of *number of computers available in the classroom* for instruction allowed estimation of the original hypothesized path diagram, but it limited the generalizability of the study findings. Therefore, *number of computers available in the classroom* was excluded from subsequent path estimates in the parsimonious model.

The other concern encountered during the pre-analysis data screening involved *years using computers in the classroom for instruction.* Several respondents ($N = 13$) provided responses higher than their response to *number of years teaching in higher* *education*. It is possible that some participants have teaching experience outside the higher education environment and included their computer use in their response to how many years they had been using computers in their teaching practice. One respondent contacted the PI and provided feedback confirming this hypothesis. It is also hypothesized that some respondents interpreted *years using computers in the classroom for instruction* hurriedly and offered the number of years they had been using computers in the classroom for their own learning. In either case, this variable was excluded from the path diagram; however, *years teaching higher education* was included. Implications of these two concerns are addressed in the final section of the study.

Respondent Sample

Table 3 presents a summary of survey respondents' gender, age, and ethnic characteristics. The counselor educators who completed the survey ($N = 253$) were between 26 and 71 years of age ($M = 47.6$, $SD = 11.99$). Sixty was the most frequent response to the question on age ($N = 17$) in the study. All age ranges seemed evenly represented in the survey when grouped by decades (e.g., 20 to 29 yrs., 30 to 39 yrs., etc.). More women ($N = 157$) than men ($N = 95$) responded, and a majority of participants, 80.6%, identified themselves as White/Non-Hispanic/Caucasian. Most reported a doctorate as their highest degree earned ($N = 199$). The majority of survey participants, 76.7%, earned their highest degree in either Counseling ($N = 58$), Counselor Education ($N = 68$), or Counselor Education and Supervision ($N = 68$).

Table 3

Summary of Participants by Demographic Characteristics

Participant demographic characteristics ($N = 253$)	N	%
Gender		
Female	157	62.1
Male	95	37.5
No response	1	0.4
Age		
20-29	17	6.72
30-39	61	24.11
40-49	58	22.92
50-59	57	22.53
60-69	57	22.53
70 and over	3	1.19
Race/Ethnicity		
Native American/American Indian	1	0.4
Asian/Asian American/Pacific islander	11	4.3
African American/Black	20	7.9
Hispanic/Latino(a)/Latin American	7	2.8
White/Non-Hispanic/Caucasian	204	80.6
Multi-racial/Multi-ethnic	9	3.6
Other	1	0.4
Highest degree completed		
Masters	51	20.2
Ed.S. (Education Specialist)	3	1.2
Doctorate	199	78.7

Participant demographic characteristics ($N = 253$)	N	%
Field of study for highest degree earned		
Counseling	58	22.9
Clinical Psychology	6	2.4
Counseling Psychology	25	9.9
Counselor Education	68	26.9
Counselor Education & Supervision	68	26.9
Marriage & Family Therapy	7	2.8
Psychology	2	.8
Social Work	1	.4
Other	18	7.1
Graduated from program accredited by:		
CACREP	157	62.1
COMAFTE	7	2.8
APA	23	9.1
Teaching courses at (check all that apply):		
Undergraduate level	55	21.7
Master's level	244	96.4
Doctoral level	73	28.9
Other level	6	2.4

A summary of self-reported number of years teaching in higher education (M = 11.055, SD = 9.977) and number of years using computers in the classroom for instruction (M = 6.806, SD = 5.401) is included in Table 4. Notice that 64.42% (N = 163) of teachers have been teaching for 10 years or less; however, 84.19% (N = 213) of teachers integrated computers into their classrooms within their first 10 years on the job.

Figure 2 illustrates the trend over the past 10 years of a change in the relationship of counselor educators entering the field to those integrating computers into their classrooms. The point on the graph where *years teaching higher education* and *years using computers in the classroom* intersect may reflect the increase in online education offerings in counselor education programs, the increasing availability of computers to students and schools, improved access to the Internet in the classroom, or other factors.

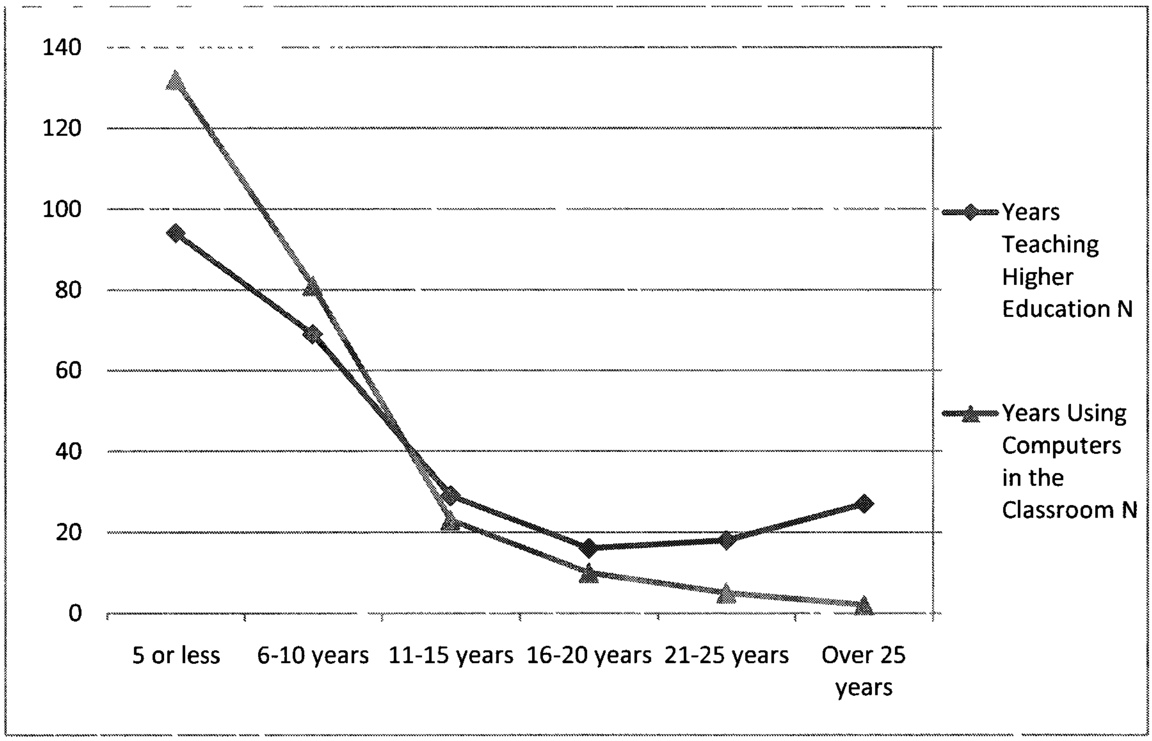

Figure 2. Graph comparing participants' number of years teaching higher education and number of years integrating computers in the classroom.

Table 4

Participants' Years Teaching Higher Education/Years Using Computers in the Classroom for Instruction

	Years teaching higher education		Years using computers in the classroom	
I have been teaching in higher education for:	*N*	%	*N*	%
5 or less	94	37.15	132	52.17
6-10 years	69	27.27	81	32.02
11-15 years	29	11.46	23	9.09
16-20 years	16	6.32	10	3.95
21-25 years	18	7.11	5	1.98
Over 25 years	27	10.67	2	.79
Mean	11.055		6.806	
Median	8.0		5.0	
Mode	1.0		5.0	
SD	9.977		5.401	

N = 253.

Participants responded as to whether they taught face-to-face, online, or both. Of the counselor educators who responded to the question (*N* = 229), 80.2% indicated they spent most or all of their time teaching face-to-face. Only 9.5% (*N* = 24) of participants reported teaching mostly or fully online. Table 5 presents a comparison of teaching modality of participants.

Table 5

Teaching Modality of Participants

I teach:	Teaching modality	
	N	%
Exclusively face-to-face	82	32.4
Mostly face-to-face/some online	121	47.8
About equally face-to-face/online	26	10.3
Mostly online/some face-to-face	15	5.9
Exclusively online	9	3.6

N = 253.

Preliminary Analysis

Survey questions solicited responses according to a 5-point Likert scale. For most questions, a response of "1" indicated *strong disagreement* or *not at all* and a response of "5" indicated *strong agreement* or *entirely*; however, several questions were constructed to elicit a reflective response; therefore, dummy variables were created in SPSS in order to reverse score these survey items. Table 6 provides a summary of Cronbach's alpha values for each scale within the survey instrument, which ranged from .62 to .90, indicating acceptable reliability of the items within each scale of the endogenous study variables. The remaining three study variables are exogenous and measured with a single question.

Path analysis requires compliance with the assumptions attributable to multiple regressions (Klem, 1995). A preliminary analysis of the endogenous variables therefore involved obtaining correlations among the variables, checking for outliers, linearity, normality, and homoscedasticity (Mertler & Vannatta, 2005).

Table 6

Cronbach's Alpha Scores for Instrument Scales

Variable	*N* of items	Cronbach's alpha
Technical Support	5	.76
General Support for Computer Use	7	.78
Confidence & Comfort Using Computers	12	.90
Attitudes Toward Computer Use	21	.80
CE Prep for Computer Use	10	.62
CE Technology Integration in Teaching	46	.85

Several study variables exhibited high correlation (see Table 7), with age and years teaching higher education presenting the highest correlation ($r = .66, p < .001$); however, no VIF was larger than 1.814. This finding suggests multicollinearity problems do not exist. For each regression, the histograms and normal P-P plots of regression standardized residuals indicated normality and linearity of the independent-dependent variable relationships. A comparison of standardized residuals to predicted values confirmed multivariate homogeneity of variance-covariance prior to estimation of the path coefficients contained in Table 8. Tests for multivariate outliers using Mahalanobis' distance identified nine cases as outliers; however, all cases were retained after further analysis suggested limited effect on the model. Preliminary analyses concluded with no indications of any violation of assumptions of multiple regression. All hypothesized relationships between variables at the bivariate level were in the anticipated direction; however, not all were statistically significant ($p < .05$).

Table 7

Study Variable Correlations, Means, and Standard Deviations

Variables	1	2	3	4	5	6	7	8	9
1. Age	1.000								
2. Years Teaching	.662**	1.000							
3. Technical Support	.144*	.159*	1.000						
4. General School Support	-.009	.042	.477**	1.000					
5. Computer Availability	.042	.048	.090	.190**	1.000				
6. Attitudes Toward Computer Use	.052	-.033	.281**	.319**	.133*	1.000			
7. Confidence & Comfort Using Computers	-.178**	-.168**	.157*	.347**	.219**	.603**	1.000		
8. CE Prep for Computer Use	-.240**	-.137*	.049	.230**	.087	.171**	.322**	1.000	
9. CE Technology Integration in Teaching	-.140*	-.030	.076	.265**	.146*	.323**	.428**	.200**	1.000
Mean	47.57	11.06	22.31	26.45	3.83	83.83	46.82	28.26	128.40
SD	11.99	9.98	4.89	4.29	7.11	8.96	7.82	3.89	18.15

*Significant at 0.05 level (2-tailed).

**Significant at 0.01 level (2-tailed).

N = 253.

Table 8

Standardized Estimates of Independent Variables

	Standardized estimates (Endogenous variables)											
	Attitudes toward computer use			Confidence & comfort using computers			CE prep for computer use			CE technology integration in teaching		
	Effect			Effect			Effect			Effect		
Independent variables	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Age	-	-	-	.181	-	.181**	.227**	-.043	-.271	-	-.079	-.079
Years Teaching	-	-	-	-.036	-	-.036	.048	-.009	.039	-	-.009	-.009
Technical Support	.166	-	.166	-	.092	.092	-	.022	.022	-	.050	.050
General School Support	.240	-	.240***	.169	.133	.302***	.142	.073	.215	-	.141	.141
Computer Availability	-	-	-	-	-	-	-	-	-	.054	-	.054
Attitudes Toward Computer Use	-	-	-	.554	-	.554**	-	.133	.133	.104	.194	.298
Confidence & Comfort Using Computers	-	-	-	-	-	-	.241	-	.241**	.333	.017	.350**
CE Prep for Computer Use	-	-	-	-	-	-	-	-	-	.071	-	.071
R^2			.123			.438			.160			.194

*$p < .05$.
**$p < .01$.
***$p < .001$.

Estimated Path Model

The maximum likelihood estimation method, the most common method of estimation for path analysis, provided the best-fitting parameter estimates, ones most likely produced from nonchance relationships. The estimated path model (see Figure 3) contains the calculated path coefficients and estimated amount of variation of each endogenous variable explained by other variables. Assessing the model's fit to the data involved estimation of parameters or the Beta coefficients that describe the relationships among the study variables. Prior to the development of sophisticated structural equation modeling software, the only way to test a model's fit was to calculate the reproduced correlation coefficients manually through path decompositions. AMOS provided several ways to assess model fit through a variety of indices that compared reproduced correlations to empirical correlations. For the current study, chi square, goodness-of-fit index (GFI), Bentlers' comparative fit index (CFI) and root-mean-squared error of approximation (RMSEA) were used to assess model fit to the data (Marcoulides & Hershberger, 1997).

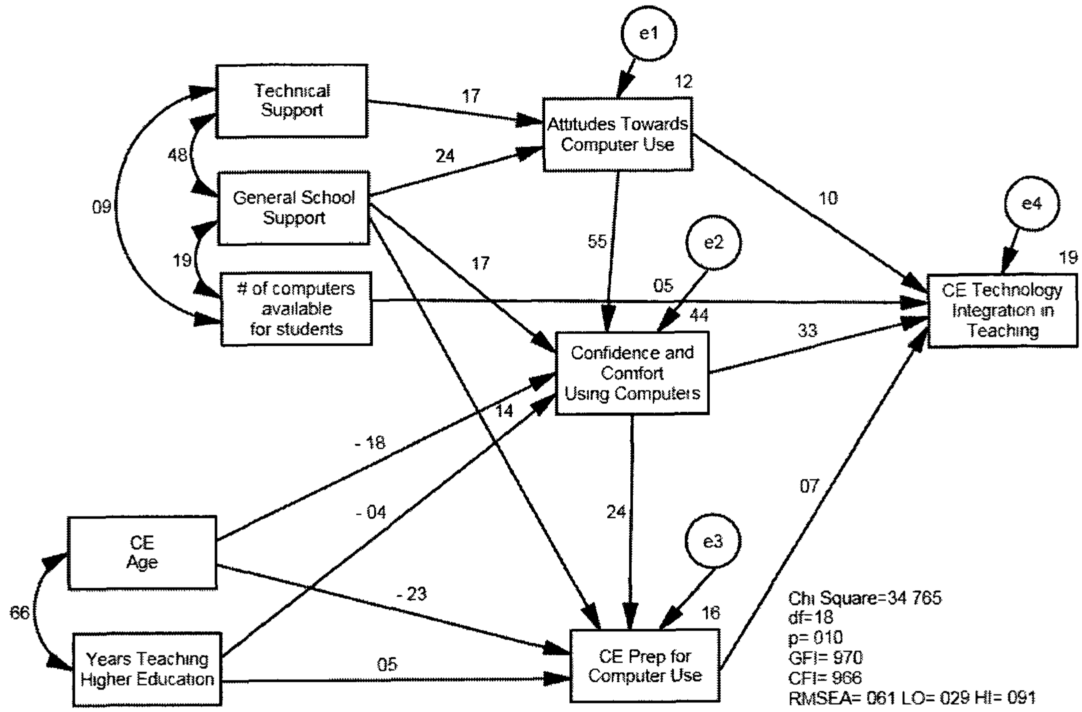

Figure 3. Estimated path model.

A chi-square test for goodness-of-fit requires obtaining a significant χ^2 value ($p < .05$); however, the null hypothesis is the desired outcome for χ^2 goodness-of-fit comparison of the estimated and parsimonious models. In other words, a nonsignificant χ^2 value is desired in order to demonstrate that the reproduced variance/covariance matrix does not significantly differ from the observed variance/covariance matrix (Browne & Cudeck, 1993). However, it is well known that tests of significance react to larger sample sizes; therefore, significance of the test may not necessarily mean a poor fit to the data (Marcoulides & Hershberger, 1997), and other measures of fit should be considered.

For the GFI and CFI, values above .950 indicate a good fit, and for RMSEA, values of less than .05 indicate a good fit, while values between .06 and .08 suggest an acceptable fit of the model to the data (Browne & Cudeck, 1993; Marcoulides &

Hershberger, 1997). The fit indices for the estimated path model were $\chi^2(18,\ N = 253) =$ 34.765, $p = .010$, GFI = .970, CFI = .966, RMSEA = .061. The proposed model as tested also provided an acceptable fit according to the chi-square test and RMSEA value; with a stronger indication of being a good fit based on CGI and CFI values obtained. Prior to interpretation of the Beta coefficients, further regression analyses on possible relationships among the variables resulted in a model with a better fit to observed variances and covariances.

Parsimonious Path Model

One goal of path analysis is provision of a parsimonious model. Although the original hypothesized model exhibited an acceptable fit to the data, elimination of insignificant paths resulted in a concise model with a better fit. The parsimonious model can be used in future tests using new data in order to assess the model's predictive accuracy (Marcoulides & Hershberger, 1997). The reduced path model presented in Figure 4 emerged after elimination of the variables number of computers available in the classroom for instruction and years teaching higher education due to their lack of significant effect on other variables under study. The fit indices for the parsimonious model were $\chi^2(9, N = 253) = 7.190, p = .617$, GFI = .992, CFI = 1.000, RMSEA = .000. All indices indicate this model represents a good fit to the data, and the parsimonious model provides a more efficient and concise working path diagram. Standardized regression weights (provided in Table 9) were all significant ($p < .001$, or $p < .05$).

The model accounted for 12.3% of the variation in attitudes toward computer use, 43.6% of the variation in confidence and comfort using computers, 15.7% of the variation in preparation for computer use, and 19.9% of the variation in technology integration in the classroom. Regarding the research question of the effect of study variables on technology integration in teaching by counselor educators, confidence and comfort using computers exhibited the largest direct effect on technology integration in the classroom (β = .383), mainly due to the significant direct effect of attitudes toward computer use on confidence and comfort using computers (β = .559). The variables attitudes toward computer use (β = .214), general school support for using computers (β = .115), technical support (β = .036), and age (β = -.049) exhibited the largest indirect effect on technology integration in the classroom respectively.

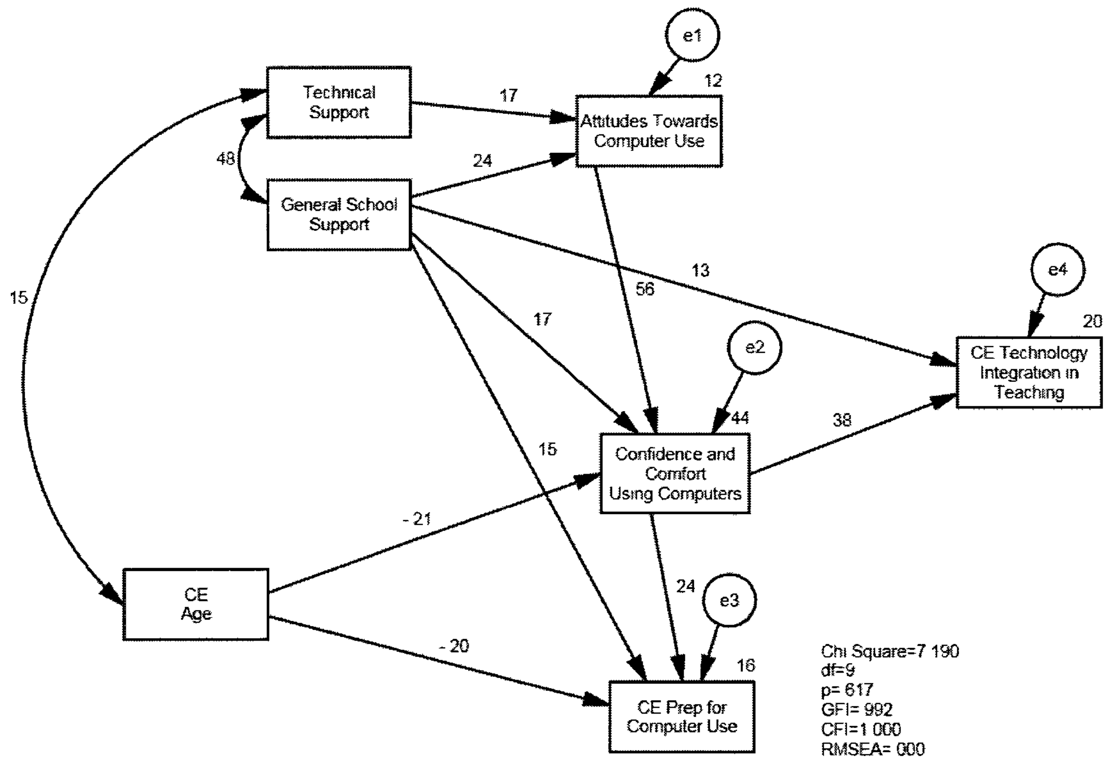

Figure 4. Parsimonious path model.

Table 9

Standardized Regression Weights (Parsimonious Model)

	Final model	
Path	β	Significance level
General School Support for Computers → Attitudes Toward Computer Use	.240	***
Technical Support → Attitudes Toward Computer Use	.166	$p = .013$
Age → Confidence and Comfort Using Computers	-.205	***
General School Support for Computers → Confidence and Comfort Using Computers	.166	***
Attitudes Toward Computer Use → Confidence and Comfort Using Computers	.559	***
Age → Preparation for Using Computers	-.196	***
General School Support for Computers → Preparation for Using Computers	.146	***
Confidence and Comfort Using Computers → Preparation for Using Computers	.237	$p = .018$
Confidence and Comfort Using Computers → Technology Integration in Teaching	.383	***
General School Support for Computers → Technology Integration in Teaching	.132	$p = .028$

*** $p < .001$.

Summary of Findings

Analysis of the estimated and parsimonious path models revealed several significant findings regarding the individual and institutional-level factors affecting technology integration by counselor educators. Two of the individual factors—age and years teaching higher education—were exogenous to the study and were provided as self-report measures of study participants. Counselor educators' age significantly affects their confidence and comfort using computers and their preparation for computer use in a negative manner. A significant positive correlation also exists between age and technical support. Years teaching higher education was not included in the final path model as previously mentioned due to methodological issues and lack of significant impact on technology integration respectively. Findings regarding the remaining individual factors, attitudes toward computer use, confidence and comfort using computers, and preparation for computer use, are presented in this section of the paper.

Individual factors affecting technology integration.

Attitudes toward computer use. Counselor educators' attitudes toward computer use, the variable with the largest direct effect on any other study variable, is influenced more by general support for computer use than by technical support. This study confirms the positive correlation between attitudes toward computers and computer use (Jencius & Paez, 2004; Massoud, 1991), although the impact on computer use seems to be mediated by confidence and comfort using computers. The hypothesized significant direct effect of attitudes toward computer use on counselor educators' technology integration was not supported in the current study. The path model accounted for only 12% of the variation in attitudes toward computer use; however, attitudes toward computer use significantly affect a counselor educator's confidence and comfort using computers ($\beta = .559$). Interestingly, attitudes toward computer use exerts the strongest indirect and direct effect of all the factors in the study. Attitudes toward computer use has the strongest indirect effect on technology integration ($\beta = .214$) as a result of its powerful effect on confidence and comfort using computers ($\beta = .559$).

Confidence and comfort using computers. With respect to technology integration by counselor educators, confidence and comfort using computers serves as a significant mediating variable for all study variables except technical support and preparation for computer use. The path model accounts for nearly 44% ($r^2 = .436$) of the variation in confidence and comfort using computers, with attitudes toward computer use, general support for computer use, and age being the primary factors. Counselor educators' confidence and comfort using computers exerts the largest influence on their level of technology integration in teaching ($\beta = .383$). This finding suggests that the best way to increase technology integration in the counseling classroom is by exploring ways of improving counselor educators' self-efficacy regarding use of computers. This finding is consistent with the literature on self-efficacy (Bandura, 1997) and technology use (Moos & Azevedo, 2009; Thatcher & Perrewé, 2002). Confidence and comfort using computers also significantly affects counselor educators' preparation for computer use ($\beta = .237$).

Counselor educator preparation for computer use. In the hypothesized path diagram, the beta coefficient describing the regression of technology integration on preparation for computer was expected to be significant; however, study results do not support this relationship. Although preparation for computer use mediates the negative effect of age on technology integration, it does not exert significant influence on counselor educators' technology integration.

Institutional-level factors affecting technology integration.

Technical support. The finding that technical support significantly affects counselor educators' attitudes toward computer use confirms results from previous research (Inan & Lowther, 2010). Technical support indirectly influences technology integration by helping to improve counselor educators' attitudes toward computer use, thereby improving their confidence and comfort in using computers. Study results do not support the hypotheses that technical support exerts a significant direct influence on counselor educators' confidence and comfort using computers, preparation for computer use, or their technology integration in teaching. Technical support shares a significant positive correlation with general school support for computer use ($r = .478, p < .001$), though general school support for computer use seems to exert a stronger influence on the other study variables.

General school suppor for computer use. Overall, general school support for computer use has the greatest amount of influence on the study variables within the path model. General school support for computer use significantly affects counselor educators' attitudes toward computer use, confidence and comfort using computers, preparation for computers, and technology integration in the classroom. The significant influence of general support for computer use on the confidence and comfort of counselor using computers is consistent with previous research indicating that encouragement and support from peers and colleagues can strongly influence an educators' use of educational technology (Inan & Lowther, 2010; Lin & Chiou, 2008; Nicolle & Lou, 2008; Sahin & Thompson, 2007).

CHAPTER IV

DISCUSSION

This study explored the effect of individual factors and institutional-level factors on counselor educators' integration of technology in the classroom. This section provides a discussion of significant findings, implications, limitations of the study, and recommendations for future research. The chapter ends with a brief conclusion of the research.

Discussion of Findings

The goal of this study was to provide a research-based causal model as a tool for predicting counselor educators' integration of technology in the classroom. As this is the first application of path analysis to the research topic in the field of counselor education, it is probable that other influential factors exist, both at individual and institutional levels, which could exert significant influence on how counselor educators use technology in training counselors. The factors selected for this study were chosen based on a review of relevant literature concerning technology integration by educators teaching in K-12, secondary, postsecondary, and higher education institutions. Two of the variables hypothesized to have significant effects on technology integration, number of computers available in the classroom for instruction and years teaching higher education, were excluded from the final path model due to methodological issues and lack of significant impact on technology integration, respectively. These two variables require further investigation in order to determine how they affect technology in the classroom. Significant findings regarding the effect of the remaining six variables on technology integration are discussed here, beginning with individual-level factors. The discussion addresses the implications of study findings for counselor education programs, technical support and faculty development, and counselor educators.

The exogenous individual characteristics explored in this study were age and years teaching higher education. Age seems to affect only two study variables significantly and directly: confidence and comfort using computers and preparation for computer use. Counselor educators' age indirectly affects technology integration, but the effect is mitigated by confidence and comfort using computers. As age increases, counselor educators seem to express less confidence and comfort using computers. They also report being less prepared for computer use. The direct effect of confidence and comfort using computers on technology integration in teaching seems weakened in part by the negative effect of age.

Similarly, the inverse relationship of age and preparation for computer use seems strong enough to reduce the overall benefits of preparation for computer use when it comes to actual use of technology in the classroom. For example, as older counselor educators attend seminars or workshops on computer use, they may not be inclined to put their knowledge to use due to a lack of confidence or self-efficacy. Mandatory attendance at computer training, workshops, or departmental in-service training on a compulsory basis may impart computer skill and instruction; however, a side effect of mandatory training could be a decrease in attitudes toward computer use. Attendees may decide to resist implementation of any knowledge and skills acquired in the training event.

Attitudes toward computer use demonstrated the largest direct effect on any other study variable. The significant influence of attitudes toward computer use on counselor educators' confidence and comfort using computers may explain why the benefits of preparation for computer use do not always materialize. Some counselor educators may feel forced to attend technology training, may not see the benefit of what they are learning and how it can help them or their students, or may feel they do not have the time or motivation to obtain technology competency and integrate it into their teaching practices. They may therefore demonstrate resistance to technology integration by focusing on barriers to applying what they may have learned. Again, age of the counselor educator may amplify resistance behaviors in older counselor educators, making them appear technophobic. These educators may be given stigmatic labels such as laggards or Luddites, thus supporting an adversarial relationship with technical support, instructional design departments, or administration. Such an adversarial relationship diminishes the effectiveness of professional development courses.

Attitudes toward computer use also demonstrated the strongest indirect effect on technology integration. This study explained only 12% of the variation in attitudes toward computer use; therefore, more research is needed to understand other influences on this variable. For example, a counselor educator may hold a resistant attitude toward implementing some new educational technology; however, in order to keep a teaching appointment, decide to go ahead and "do what must be done" in order to remain in the classroom. In this case, the negative effect of attitude is mitigated by the need for job security. The counselor educator's overall attitude toward problem solving may be a powerful factor affecting his or her specific attitude toward computer use. A highly positive outlook toward problem solving as a fun or stimulating activity may result in a highly positive view of learning new educational technology. Other variables, such as age, may interact with these yet unexplored variables to affect counselor educators' attitudes toward computer use.

Another interesting finding in this study is the nature of the relationship between age and technical support. Age and technical support share a significant covariance ($r = .15, p < .01$). As counselor educators age, they seem to express more positive views of technical support. This increased positive outlook on technical support may be linked to more frequent successful use of technical support services. It is also possible that counselor educators who report lower levels of confidence and comfort using computers may seek out and rely upon technical support more often. In either case, older counselor educators rate technical support more highly than their younger peers, but older counselor educators demonstrate a corresponding lower level of confidence and comfort using computers, as previously discussed. The significant inverse effect of age is not observed with respect to counselor educators' attitudes toward computer use. Study findings concerning the lack of significant effect by age on attitudes toward computer use are consistent with those reported by Broady et al. (2010).

Technical support and attitudes toward using computers share a significant positive correlation, and attitudes toward computer use has the largest significant direct effect on confidence and comfort using computers. Technical support may therefore serve as a mitigating factor for older counselor educators. Though the indirect effect is small, better technical support and general support for computer use may improve counselor educators' attitudes toward computer use, which may improve their confidence and comfort using computers.

It was hypothesized that the other exogenous individual-level factor in the study, years of teaching higher education, would affect endogenous variables in much the same manner as age, but the results of the study do not support this hypothesis. Study findings suggest that the more experience counselor educators gain in teaching, the more confident and comfortable they become in using computers and the more prepared they feel using computers. For example, a counselor educator who is 55 years of age and has been teaching for 25 years is more likely to feel prepared, confident, and comfortable in using computers than a counselor educator of the same age who has only 2 years of teaching experience. Experience and time seem to play an important role in a counselor educator's level of self-efficacy in computer use.

Self-efficacy has a powerful effect on the learning process (Bandura, 1997). Confidence and comfort using computers provided one measure of self-efficacy for counselor educators regarding computer use in the classroom. In this study, counselor educators' confidence and comfort using computers directly affected technology integration more than any other variable studied. Although this finding does not provide new information regarding the impact of confidence on the learning process, it does provide valuable insight into how to improve the ability of counselor educators to learn new technology. For example, an individual encountering a new educational technology, such as smart board—a technology that combines a white board, short-throw projector, and a computer interface and software program to create an interactive white board a teacher can control with an electronic pen—may feel overwhelmed by all of the equipment and software. The teacher may see no hope of ever mastering such a complex technology in the classroom. Oftentimes, the technical trainer may try to reassure the teacher that the technology is "easy to use" and begin to demonstrate how easy the trainer can maneuver the program; however, the teacher's feelings of anxiety only increase as he or she watches the trainer speeding through complex menus and commands. In this case, the teacher will probably not put forth the effort to learn to use the smart board system in the classroom.

The trainer might be more successful by first focusing on helping the teacher build confidence by allowing the teacher to experiment with the technology. For example, rather than telling the teacher how to create a new document, the trainer could ask the teacher, "As you look at the menu choices available, which of the menus shown would be your top two choices for where you most likely would find the command to create a new document?" This process engages teachers interactively and sets them up for success by giving them the possibility to make two guesses. By giving the teacher a way out if he or she guesses incorrectly, the trainer allows the teacher to maintain a level of comfort during the learning process, which in turn may increase the teacher's confidence. As educators become more confident and comfortable with technology, they are more likely to be better prepared to use it.

In the hypothesized path diagram, preparation for computer was expected to exert a significant influence on technology integration; however, no significant effect was demonstrated in the study. Although preparation for computer use mediates the negative effect of age on technology integration, it does not exert significant influence on counselor educators' technology integration. The effect of preparation for computer use on technology integration requires further research. The lack of significant effect of preparation for computer use on technology integration may be due to the relatively large unexplained variation, approximately 84%, in preparation for computer use. Perhaps factors not included in the current study such as pedagogy, actual technology competency, or teaching load might interact with preparation for computer use in a way to increase technology integration. The full effect of preparation on technology integration may yet be unaccounted for without the inclusion of missing factors, both at individual and institutional levels.

Although some counselor educators may be self-supporting when it comes to technology, counselor educators need to have quality technical support from their educational institution. However, even high-quality support does not seem to have a significant direct effect on technology integration in the classroom. For example, a counselor educator experiencing difficulty getting a 2-minute video clip in a presentation to play correctly cannot afford to take the time to contact technical support for assistance. The counselor educator will most likely move on without the clip or ask for a student volunteer to assist in getting the technology to work. In this case, technical support, though it may be available, goes unused by the counselor educator. General support for computer use may play the more important role in technology integration in similar situations.

General support for computer use demonstrated the greatest overall influence within the path model. This finding makes sense, especially when viewed through the lens of culture. Institutions have culture, especially in regards to technology. Some institutions discourage the use of technology in the classroom, while other institutions actively support and encourage adoption of the latest technology. Companies such as Google and Facebook have received praise for their support of family needs within their corporate culture. Highly flexible work schedules, onsite shopping, and other benefits help create a relaxed work environment designed to promote greater creativity in the workplace. Technology becomes fun, rather than mundane work or a stressful challenge. This type of work environment might rarely exist in an educational institution, but efforts to move institutional culture in this direction might afford educators a workplace more conducive to experimenting with new educational technologies. Such a change in academic culture could have far-reaching positive implications for teachers and students.

Implications

The findings of this study have many implications for the stakeholders in the field of counselor education. Counselor education programs, technical support and faculty development staff, and counselor educators stand to benefit from this research.

For counselor education programs.

This study provides valuable insight for counselor education programs in attracting, hiring, and retaining counselor educators who practice technology integration. Programs searching for such educators could use a brief survey to assess prospective educators' attitudes toward computer use and corresponding confidence and comfort in using computers in order to improve the chances of hiring an educator who will use technology in the teaching process. Counselor education programs that provide valuable general school support for computer use along with a culture that embraces technology in all aspects of counselor education can improve their chances of attracting educators committed to the effective use of technology in teaching. For example, the PI recently attended a conference presentation demonstrating how one counselor education program had already started fully integrating the latest iPad-2 into their program. The presenters were very excited about the use of the technology personally, and the enthusiasm was contagious to those in attendance. It would not be hard to imagine that this program will attract an increasing number of students as well as catch the attention of qualified educators with a passion for technology integration.

Counselor education programs are more likely to achieve successful technology integration if the program's culture embraces a positive forward-thinking attitude toward using technology in the classroom. As programs explore new ways to implement existing computer hardware and software, along with newer technology such as the i-Pad, smart boards, student response systems, and wireless technology, the culture will continue to encourage confidence and comfort in using technology. Programs that want technology integration, but do not actively seek to understand and change current cultural mores regarding technology, may find adoption of technology difficult. For example, younger "digital native" faculty may have a stronger desire to explore and to adopt new classroom technology than older "digital immigrant" administrators and meet resistance because "this is the way it has always been done." Setting the tone at the top for technology use is vital to the successful integration of educational technology in the classroom.

Professional organizations for counselor education, such as ACES and CACREP, should consider strategies for improving counselor educators' attitudes toward computer use and their confidence and comfort using computers. This study highlights the important role attitudes and confidence play in self-efficacy of counselor educators regarding technology use. The CACREP 2009 standards were written in such a way as to encourage and not limit the adoption of technology in face-to-face, blended, and fully online classrooms. In other words, CACREP has not limited technology to distance learning environments, neither has CACREP dictated specific technology that should be used. ACES may benefit from adopting the same type of stance; however, such a stance may prove more difficult to achieve because someone must delineate outcome measures for counseling students, counselor educators, and counselor education programs. The problem with specifying outcome measures regarding technology is that by the time the measures are published, they are already out of date.

Another problem with providing specific technology competencies for students, educators, and programs is the vast continuum of current competency that exists. For example, some students are far ahead of educators in technology competency. Likewise, counselor education programs differ greatly in technology integration from those that still use VHS technology in counseling labs to those that stream video of counseling sessions via a secured virtual private network. One can see how difficult standard setting can be with such developmental continuum for students, educators, and training programs.

For technical support and faculty development.

A focus by counselor education programs on ways of improving counselor educators' attitudes toward computer use in general and their confidence and comfort using computers will most likely have the greater influence on whether counselor educators integrate technology in the classroom, as compared to an emphasis on computer training classes or workshops. Faculty development courses in technology that do not seek to increase counselor educators' attitudes toward computer use or confidence and comfort using computers could be less effective than courses focusing on improving these influences on self-efficacy. Counselor educators who use technology in the classroom do so mainly because they feel confident and comfortable using the technology. The goal of faculty development efforts seems directed toward improving preparedness for using computers, which may have an indirect effect on the confidence level of the counselor educator; however, the findings of this study suggest that this indirect effect is insignificant in promoting technology use in the counselor education classroom.

Programs that spend more effort on technical support and skills training should consider redirecting resources into ways of improving attitudes and confidence levels of counselor educators. Providers of computer or technology training can benefit by integrating some basic counseling skills into the process of technology training for counselor educators. For example, computer workshops often have attendees at various levels of skill and comfort in using computers. Those who are experienced may become bored or ask advanced questions during the training, while computer novices or those who lack confidence in using computers may feel left out. By using active listening skills, building empathy, reflecting meaning, and other basic counseling skills, training providers may be more effective in discerning the technology culture of the counselor educator, building rapport with them, and encouraging feelings of self-efficacy necessary for effective learning.

Too often, it is easy for the technical trainer or support staff to overwhelm a trainee by simply doing what the trainer does best: using technology quickly, efficiently, and effortlessly. For instance, those who do not adopt technology are often labeled *technophobic*. If a counselor was working with a client who had a phobia, the counselor would know the importance of building an empathetic relationship with the client before attempting many of the interventions that would normally be helpful in alleviating the client's fears. In the case of a counselor educator with technophobia, the trainer or workshop presenter should strive to build empathy with the counselor educator. If the trainer fails to connect with the technophobic counselor educator, the trainee leaves with feelings of inadequacy and intimidation, exiting the training experience with minimal learning. Technical trainers and support staff could increase their effectiveness in preparing counselor educators to use technology in the classroom by using effective communication skills in the training process.

Counselor educators who have more positive attitudes toward using computers will be more likely to feel confident and comfortable in putting the technology to use in the classroom, especially if they are surrounded by higher levels of technical support and general school support for computer use. Improved attitudes toward computer use and higher levels of confidence and comfort using computers may compensate for deficiencies of counselor educators' preparedness, training for computer use, or lower levels of available technical support.

For counselor educators.

Counselor educators desiring to improve their technology integration in the classroom need to spend time understanding the benefits of staying current with educational technology. On one hand, counselor educators who take time to play with new technology to see what it can do can reduce or alleviate negative attitudes and feelings toward the technology. On the other hand, those who conceptualize all technology as "more work" may experience an increase in negative attitudes and feelings toward technology, leading to more stress and less career satisfaction. Counselor educators can increase positive feelings about technology integration by self-application of the same counseling skills they would teach to students or use with clients.

The best way for counselor educators to increase the integration of technology in their teaching environment is by finding ways to improve their attitudes toward using computers and increasing their levels of confidence and comfort using computers. Although being more prepared may impact both their attitude and confidence or comfort levels, study findings indicate a minimal overall impact of preparation for computer use on actual technology integration overall. Having support for computer use from fellow faculty and staff has the strongest effect on counselor educators' attitudes toward computer use, confidence and comfort using computers, and overall technology integration. Counselor educators wanting to improve their technology integration should seek teaching appointments in institutions that have a culture that supports and encourages the use of technology in teaching. Supportive environments allow adequate class release time to allow the counselor educator opportunities to explore and to learn new educational technologies without pressure. Although training is important, people often report learning technology best by "playing around" as opposed to having to take a class.

Limitations of the Study

Although care was taken in the design and execution of the study, certain limitations may affect the interpretation and generalization of survey findings. First, the survey instrument used was originally designed specifically to assess technology integration in K-12 classrooms. The survey questions were adapted with permission of the survey authors, and care was taken to leave the instrument as close to its original form as possible. The question asking respondents to provide the number of computers available in the classroom for instruction was met with confusion by participants. Because K-12 education is conducted in a face-to-face classroom, the question collected useful information concerning the availability of computers in the classroom for the survey instrument's originally intended audience. However, several counselor educators expressed difficulty in responding to the question because they taught either partially or wholly in an online environment. An effort was made in the instructions to coach participants on how to respond in such cases, but the validity of responses to the survey item is questionable due to the confusion that surrounded the wording of the question.

Second, data collected concerning participants' number of years using computers in higher education for instruction may contain inconsistencies as well. Some respondents may have included unintended data in their response, such as including the number of years they used computers in the classroom for learning. Respondents with teaching experience in primary or secondary school settings could have included years using computers in those classes, thereby confounding the responses to the question. Future research should make appropriate clarifications to these questions in order to control for such limitations.

Third, participants in the study volunteered to complete an online survey. Those who chose to respond did so because they had access to a computer and they possessed some level of comfort in using computers. The study does not include a representation of participants who do not use e-mail or have Internet access to online surveys. These nonparticipants might have provided information that differed from current study participants. Getting more in-depth answers to what could be viewed as apparent resistance to integrating technology by those who chose not to respond could lead to better technology training methods. Counselor educators not subscribed to the CESNET listserv may not have been represented in the survey, unless they responded to the email invitation sent to the current ACES membership list.

Fourth, the self-report measures for the study variables do not provide an objectively verifiable assessment of the constructs studied. Overstatement and understatement of actual technology competency level often occurs in self-report measures of characteristics otherwise objectively measurable. Self-report measures using a Likert scale offer no common standards by which to measure either the magnitude or existence of constructs such as confidence and comfort using computers, attitudes toward using computers, preparation for computer use, or technology integration in the classroom.

Finally, the study did not include all potentially influential factors on counselor educators' technology integration. Individual-level factors including teacher computer proficiency and teaching load were excluded from the current study; however, some studies have suggested they may exert influence on teachers' technology integration (e.g., Inan & Lowther, 2010; Meyer & Xu, 2009). Inclusion of these variables may further explain technology integration in the classroom.

Recommendations for Future Research

This research represents the first path analytical study that has investigated intrinsic and extrinsic factors affecting counselor educators' technology integration in the classroom. Recommendations for future research are offered in order to advance the study of technology integration in the counselor education process. For example, future research into technology adoption and diffusion in counselor education should include research methodologies that can explore the nonstatic nature of technology with counselor education (Choudrie & Dwivedi, 2005). Other investigational methods should be used, such as longitudinal surveys, case studies, and phenomenological studies. Perhaps a mixed-methods design might combine quantitative data with rich qualitative data in order to provide a multidimensional look at the factors influencing effective integration of technology in the counselor education process. Additional research should also include other variables with potential influence on technology integration by counselor educators. One such variable is *personal innovativeness.*

Personal innovativeness has been explored as a factor in the diffusion and adoption of technological innovation (e.g., Agarwal & Prasad, 1998a, 1998b). More research is needed to understand how counselor educators' personal innovativeness affects their technology integration in the classroom. Counselors must be able to view problems from different perspectives in order to assist clients, and counselor educators need the same skill in helping counselor trainees find solutions in working with clients. Personal innovativeness is a trait that enables one to see problems and challenges in new ways and, thus, see new solutions. For example, some counselor educators may view learning computer technology as a "struggle to be endured," while others may view learning new technology as a "challenge to be taken on."

Future research should include a variable encompassing the perceived level of technology competence of counselor educators. A greater need may be to explore the actual level of technology competence of counselor educators using more objective methodology than self-report assessments. Although some research has explored technology integration by counselor educators within specific settings, such as within school counseling (Holcomb-McCoy, 2005; Rainey, McGlothlin, & Miller, 2008; Sabella et al., 2010), more research is needed to explore other settings in which counselors work (Myers & Gibson, 1999). Still, additional research could further explore the effects of counselor educators' individual characteristics on their technology use. For example, gender and ethnic characteristics may influence technology use (Jackson, von Eye, Fitzgerald, Zhao, & Witt, 2010).

A larger sampling of counselor educators would offer a clearer view of technology integration in counselor education programs across the country, while also sampling counselor educators with less technological acumen. Responses could be gathered from counselor educators at conferences and from program directors of counselor education programs in the United States and abroad. Replication of this study using the pencil-and-paper form of the survey instrument might provide a broader picture of counselor educators' technology practices because of significantly higher response rates (Hogarty et al., 2003). A pencil-and-paper version may also capture the responses of those who do not use technology.

Further research that matches counseling students' perceptions of technology integration in their classes to responses to similar questions asked of their professors would offer great insight into the congruence of educator and student perspectives of integrated technology in the classroom, whether face-to-face or online. Including some measure of effectiveness of technology integration seems necessary for stakeholders in counselor education in order to determine best practices for technology use in teaching. Although educators may report effective integration of technology in the classroom (Lundberg, 2000), evidence to support the use of technology in the classroom for more than information acquisition and recall seems limited (Lim & Chai, 2008). Such limited application of technology integration in the classroom could have many causes.

Teaching style, commonly referred to as pedagogy, may play an important role in technology integration in the classroom. Counselor educators can choose from a variety of pedagogical frameworks in teaching (Fong, 1998), and effective integration of technology may require a rethinking of teaching style or pedagogy (Ascough, 2002; Ertmer, 2005; McWilliam, 2008). Further research could provide insight into the current pedagogical practices of counselor educators (D. H. Granello & Hazler, 1998; Judson, 2006; Nelson & Neufeldt, 1998; Sexton, 1998) and offer suggestions as to the effectiveness of specific approaches such as transformative teaching and learning (Kitchenham, 2006; Meyers, 2008) or a developmental approach (Mills & Tincher, 2003) on technology integration. Research has suggested students have preferred learning styles (Grasha & Yangarber-Hicks, 2000) just as teachers have a preferred teaching style. Further research designed to explore counselor educators' preferred learning styles and teaching styles regarding technology could provide results leading to the inclusion of other influential factors affecting technology integration in the counselor education classroom.

Conclusion

This study explored the effects of individual and institutional-level factors on counselor educators' integration of technology in their teaching environments. Based on previous research of technology integration in K-12, secondary, and postsecondary environments, the study fills a gap in the literature by providing the first known research-based path model describing some of the factors that affect counselor educators' integration of technology in the process of teaching counseling courses. The hypothesized path model was estimated and revised to reflect the significant factors affecting technology integration. Study findings suggest that counselor educators' confidence and comfort using computers plays the most significant direct role affecting technology integration in the counseling classroom and that general school support for computer use significantly affects confidence and comfort levels of counselor educators regarding their use of computers. The only significant negative influence on confidence levels seems to be counselor educator age, which also negatively influences their preparation for computer use. These findings provide important implications for counselor education programs, counselor educators, and technical support departments.

Counselor education programs, along with counselor educators and technical support staff, can best influence technology integration in counselor education by efforts aimed at increasing counselor educators' confidence and comfort using computers or self-efficacy. Technology integration in counselor training is important for several reasons. Counselors need to be able to understand how technology affects their clients' lives and how they as counselors can help clients using technology in service delivery. Professional organizations such as ACES and CACREP encourage the development of technology competency by counseling students; therefore, counselor educators must develop and maintain a high level of technology competency themselves. Because more counselor education programs are turning to distance education delivery to prepare counselors, more research is needed to understand the complex nature of effective technology integration in the counselor education process.

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APPENDIX A: HUMAN SUBJECTS REVIEW APPROVAL

REGENT UNIVERSITY

September 28, 2010

RE: Verification of John Kennedy's Human Subjects Review/Internal Review Board

To Whom It may Concern,

I am writing this letter on behalf of John Kennedy to verify that the Human Subjects Review Committee/Internal Review Board (HSRC/IRB) at Regent University has approved Mr. Kennedy's research proposal. The title of Mr. Kennedy's research is *"Factors Affecting Counselor Educators' Integration of Educational Technology: A Path Analysis"* and promises to be a significant contribution to the field of behavioral health.

The faculty in the Doctoral Program in Counselor Education and Supervision (DPCES) is grateful that your organization is providing this experience for Mr. Kennedy. Should you have additional questions, please feel free to contact me at 757-630-4442.

Respectfully Submitted,

Lee A. Underwood, Psy.D.,
Professor of Counseling & Director of Clinical Training
Co-Chair of HSRC/IRB

APPENDIX B: PARTICIPANT SOLICITATION E-MAIL

Dear fellow counselor educator and/or ACES member:

We are conducting a research study on the factors affecting counselor educators' integration of technology in the classroom. We cordially invite counselor educators to participate in a survey regarding the ways you learn about and use technology in your teaching. Your experiences and perspective have much to contribute to this research, and we hope you will take a moment to consider participating. This study has been approved by the Regent University School of Psychology and Counseling Human Subjects Review Committee. Partial funding for the study has been provided by a research grant from the Southern Association for Counselor Education and Supervision (SACES).

You are eligible to participate in this study if you are 18 years of age or older and are currently teaching counseling-related courses in a counselor training program

Participation involves responding to a brief internet questionnaire regarding issues related to your use of educational technology, including your preparation, available support, types of software used in the teaching environment and elsewhere, and your attitude toward using computers. The survey can be completed online and is expected to take 15-20 minutes.

If you are interested in learning more about participating, please click on the link below (or cut and paste the URL into your web browser), and you will be directed to the participant consent document for this study:

https://www.surveymonkey.com/s.aspx

This link is uniquely tied to this survey and your e-mail address; however your responses to the survey are collected anonymously. Please do not forward this message.

Thanks for your participation!

Please note: If you do not wish to receive further e-mails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

Sincerely,

John F. Kennedy, M.A.
Ph.D. Candidate
Regent University
johnken@regent.
(901) 432-7715

Elisabeth Suárez, Ph.D.
Faculty Advisor
Regent University
esuarez@regent.edu
(757) 352-4834

APPENDIX C: INFORMED CONSENT FORM

PROJECT TITLE: Factors Affecting Counselor Educators' Integration of Educational Technology: A Path Analysis

INTRODUCTION

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. This is a study that seeks to explore the factors affecting counselor educators' integration of technology in the counselor education classroom. Participants will be asked to complete a brief survey questionnaire by responding to an internet survey instrument.

RESEARCHERS

John F. Kennedy, M.A. *(Responsible Primary Investigator)*
Doctoral Candidate at Regent University Counselor and Education & Supervision Ph.D. Program.

Elisabeth Suárez, Ph.D. *(Faculty Designee)*
Associate Professor, Regent University School of Psychology & Counseling

DESCRIPTION OF RESEARCH STUDY

Several studies have been conducted looking into the use of technology by counselor educators. None of them have explained the effects of intrinsic and extrinsic factors affecting how counselor educators integrate technology into the counselor education classroom. This study seeks to test a proposed model describing the interaction and impact of individual counselor educators' factors and school-level factors on the integration of technology into the counselor education process.

If you decide to participate, then you will be asked to complete a survey questionnaire, which should take 15 to 20 minutes. The data collected from the survey will be analyzed to discover the relationship between individual counselor educator characteristics, school-level characteristics, and technology integration in the counselor education classroom.

PARTICIPATION REQUIREMENTS

Participants must be counselor educators who are currently active teaching courses in programs of study designed to train counselors. Study participants must be able to complete an internet survey instrument.

RISKS AND BENEFITS

RISKS: There are no foreseeable risks related to this study. Should you experience any emotional discomfort or distress, please feel free to discontinue the survey and seek assistance should you feel the need to process any discomfort that emerges. As with any research, there is some possibility that you may be subject to risks that have not yet been identified.

BENEFITS: Participants in this research may benefit by gaining insight into new ways to learn and to apply technology in the counseling education classroom. Participants will benefit by helping increase the knowledge base of technology use by counselor educators.

COSTS AND PAYMENTS

The researchers are unable to give you any payment for participating in this study, and there is no cost to participate in the study.

NEW INFORMATION

If the researchers find new information during this study that would reasonably change your decision about participating, then they will give it to you.

CONFIDENTIALITY

No personally identifiable information will be collected other than certain generic demographic information. All information obtained about you in this study is strictly confidential unless disclosure is required by law. The results of this study may be used in reports, presentations and publications, but the researcher will not identify you. Your data will be aggregated with the data of other participants.

WITHDRAWAL PRIVILEGE

It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study -- at any time.

COMPENSATION FOR ILLNESS AND INJURY

If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of harm arising from this study, neither Regent University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in this research project, you may contact John F. Kennedy at 901-432-7715, or Dr. Lee Underwood, current HSRC chair at 757-352-4461, who will be glad to review the matter with you.

APPROVAL OF RESEARCH

This research project has been approved by the Human Subjects Review Committee of the School of Psychology and Counseling at Regent University. The research has been partially funded by a research grant from the Southern Association for Counselor Education and Supervision (SACES).

VOLUNTARY CONSENT

By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study, and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers should be able to answer them:

John F. Kennedy, M.A.	901-432-7715	johnken@regent.edu
Dr. Elisabeth Suárez	757-352-4834	esuarez@regent.edu

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr. Lee Underwood, the current HSRC chair, 757-352-4461.

And importantly, by signing below on the paper version, or clicking YES on the internet version, you are telling the researcher YES, that you agree to participate in this study.

1. I have read and understand the above description of this study. I hereby acknowledge the above and give my voluntary consent for participation in this study.
2. I understand that I am being asked to complete an online survey questionnaire.
3. I also understand that if I participate, I may withdraw at any time without penalty.
4. I also understand that I must be 18 years or older in order to participate in this study.

Your signature on the printed survey or your clicking YES on the internet survey indicates your consent to be part of this study.

____________________________________ ________________

Participant Date

John F. Kennedy, M.A. ________________

Principle Investigator Date

APPENDIX D: PERMISSIONS TO USE

John F. Kennedy
1000 Cherry Road• Memphis, TN 38117
Phone: 901.432.7715 • Fax: 901.761.1358 • E-Mail: jfk1465@gmail.com

August 29, 2011

Kristine Y. Hogarty, Ph.D.
Director of Assessment
USF College of Education
4202 East Fowler Avenue
EDU105
Tampa, FL 33620-5650

Dear Dr. Hogarty:

I am thankful for your permission per our recent email communication for me to adapt the Perception of Computers and Technology for my doctoral dissertation at Regent University entitled "Factors Affecting Counselor Educators' Integration of Educational Technology: A Path Analysis." This letter will confirm our email communication. I understand that I have not been granted permission to publish the original Perception of Computers and Technology assessment, or the adapted version.

The requested permission extends to any future revisions and editions of my dissertation, including non-exclusive world rights in all languages, and to the prospective publication of my dissertation by UMI. These rights in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign this letter where indicated below and fax it to me at 901.761.1358, or you may scan and email it to jfk1465@gmail.com. Thank you again for your help and encouragement.

Sincerely,

John Kennedy, LMFT, LPC-MHSP

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

Kristine Y. Hogarty, Ph.D.
Date: 8/29/11

John F. Kennedy

1000 Cherry Road• Memphis, TN 38117
Phone: 901.432.7715 • Fax: 901.761.1358 • E-Mail: mjencius@kent.edu

August 29, 2011

Dr. Marty Jencius,
Associate Professor of Counseling
Kent State University
310 White Hall
Kent, OH 44242

Dear Dr. Jencius:

Thank you for your permission per our recent email communication for me to adapt the ACES Technology Competencies from 1997 and 2007 for use in a comparison table within my doctoral dissertation at Regent University entitled "Factors Affecting Counselor Educators' Integration of Educational Technology: A Path Analysis." This letter will confirm our email communication. I will, of course, provide proper reference in using the materials.

The requested permission extends to any future revisions and editions of my dissertation, including non-exclusive world rights in all languages, and to the prospective publication of my dissertation by UMI. These rights in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that you, as one of the authors of above-described material, consider the materials to be part of the public domain.

If these arrangements meet with your approval, please sign this letter where indicated below and fax it to me at 901.761.1358, or you may scan and email it to jfk1465@gmail.com. Thank you again for your help and encouragement.

Sincerely,

John Kennedy, LMFT, LPC-MHSP

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

Dr. Marty Jencius

Date: 8-30-2011

APPENDIX E: ABRIDGED ARTICLE

Introduction

Counselor educators have been given the task of building counseling students' technological competence as evidenced by guidelines for online instruction (ACES, 1999a) and technical competencies for counselor education (ACES, 1999b; 2007) adopted by ACES. In order to carry out this responsibility, counselor educators should be competent in learning and using classroom technology. Many individual and institutional level factors affect educators' technology integration in the classroom. Few studies have explored the impact of factors at both levels on technology integration in education (Tondeur, Valcke, & van Braak, 2008), and research specific to counselor educators' technology integration has not kept pace with technology's rapid development (Berry et al., 2003; Quinn, Hohenshil, & Fortune, 2002; Sabella et al., 2010).

Technology in counseling.

Counseling and computers have a history that extends back into at least the 1950s and 1960s (Granello, 2000), and counselors have been integrating technology into their work over the past 30 years (Cabaniss, 2002). Internet, e-mail, websites, videoconferencing, listservs, computer simulation, databases, chat rooms and discussion groups, and other or non-Internet-based technologies been used by counelors (Cabiniss, 2002). Some therapists have even created a program containing prewritten responses for individualized corrective feedback to clients exhibiting faulty cognitions (Helgadóttir, Menzies, Onslow, Packman, & O'Brian, 2009). For the most part though, the quest to use computers to replace therapists has not attracted as strong an interest as the task of integrating computers in education, but the application of technology to the counselor education process is just beginning (Karper, Robinson, & Casado, 2005).

Technology in counselor education.

Research into the integration of technology in counselor education has been sparse compared to research of technology integration in education, and the current state of technology integration in counselor education remains relatively unexplored (Quinn et al., 2002). Counselor educators have been encouraged to embrace technology and take full advantage of what it offers in classroom application (Karper et al., 2005; Quinn et al., 2002), in both traditional face-to-face classrooms and in online classes (Glass, Daniel, Mason, & Parks-Savage, 2005). Counselor educators have used course web sites, PowerPoint, video clips, videoconferencing, and videotaping in both traditional and online classrooms (Baggerly, 2002). Recently, Web 2.0 technologies such as 3-D worlds, web conferencing, blogs, Wikis, podcasts, and vodcasts, have gained popularity recently in some counselor training programs (Rockinson-Szapkiw & Walker, 2009). Counseling students have demonstrated acceptance of technology in their counselor education programs (Berry et al., 2003; Hayes & Robinson III, 2000).

Counseling students' exposure to a wide array of technology in their counselor training programs can "enhance practice management, client and professional education, and access to information that can directly impact counseling effectiveness" (ACES, 2007, p.1). Karper et al. (2005) highlighted the need for counselor educators and programs to integrate web-based instruction, computer-assisted instruction, and the Internet in the counselor education classroom, and many counselor education programs have done so (Hayes, 2008). Examples of technology used by counseling students include e-portfolios (Carlson & Yohon, 2008; Walker, Rehfuss, & Parks-Savage, 2008), online supervision (Chapman, 2008; Hayes, 2008; McAdams & Wyatt, 2010; Vaccaro & Lambie, 2007), websites (McGlothlin, West, Osborn, & Musson, 2008), computer-assisted instruction, interactive computer simulation, web-based instruction (Hayes, 2008), and counseling laboratories and clinics equipped with sophisticated information and communication technology (Lee & Jordan, 2008).

This study explored factors affecting counselor educators' integration of technology in counselor education. Proposed causal models (Inan & Lowther, 2010; Meyer & Xu, 2009) have been developed to describe the direct and indirect effects of individual educator-specific variables and institutional-level variables in secondary education, and this study offered such a model for counselor educators. Using a research-based path analysis model (Inan & Lowther, 2010; Matthews & Guarino, 2000; Meyer & Xu, 2009; van Braak et al., 2004), this study described the effects of individual and institutional variables on technology integration in counselor education.

Educator specific variables in this study included age, years of teaching experience, preparation for computer use, attitudes towards computer use, and confidence and comfort using computers. Institutional variables in this study included general school-level support for computer use, technical support, and number of computers available in the classroom for instruction. The creation of a model describing individual-level and institutional-level influences on technology bridges a gap in the counseling education literature on technology integration.

Method

This study investigated the fit of a hypothesized path model with the observed correlations among the variables using observed variable path analysis, which tests the hypothetical relationships between variables represented in graphical form in the path diagram (Klem, 1995). The variables explored in this study included the following: Counselor educators' preparation for computer use, confidence and comfort using computers, general school support for computer use, technical support, availability of computers for instruction, attitudes toward computer use, and counselor educators' integration of technology in the classroom. Several path models of technology integration in the classroom (Inan, 2007; Inan & Lowther, 2010; Matthews & Guarino, 2000; Meyer & Xu, 2009; van Braak et al., 2004) provided a basis for the hypothesized path model in the current study, a model that places study variables in four columns from left to right: Two exogenous educator demographic variables, three exogenous institutional-level variables, three individual educator-level variables, and one endogenous variable. In this study, the terms *computer* and *technology* are used interchangeably. Self-report measures provide observed values for all study variables. The hypothesized relationship of the study variables is presented in Figure 1.

Participants

Participants for the study came from two main sources. The CESNET-L listserv provided the first source for qualified participants. An invitation to participate, including informed consent, went out to 1,697 subscribers comprised of counselor educators,

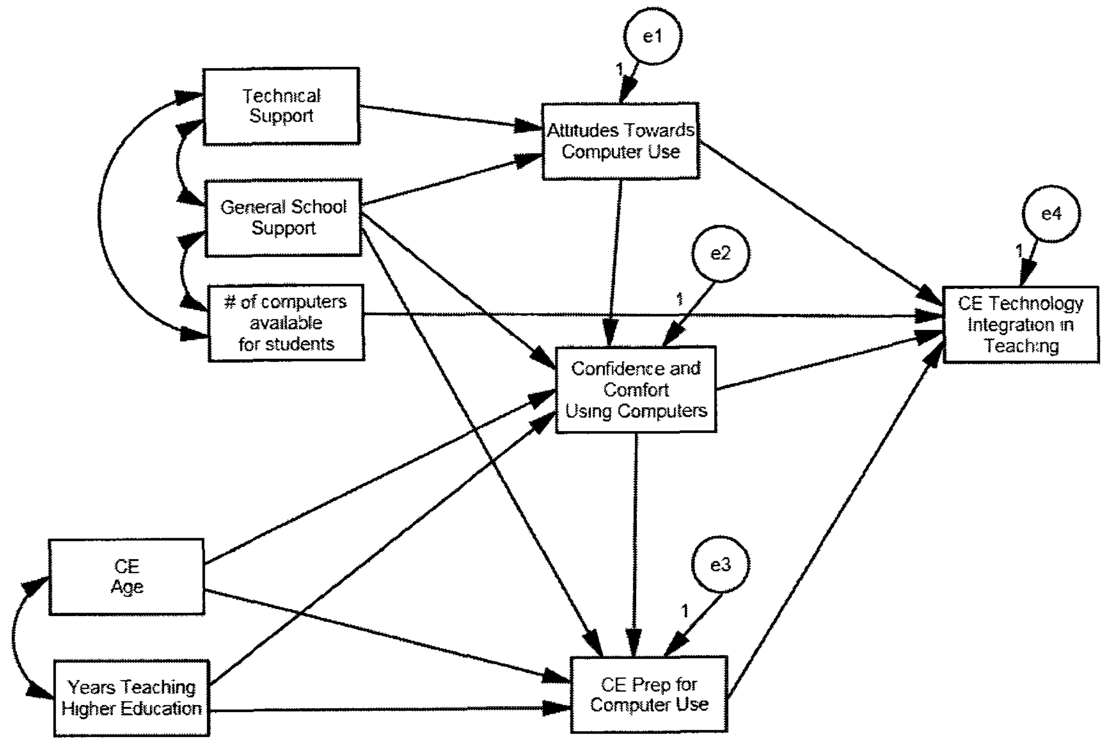

Figure 1. Hypothesized path model.

counselor education students, and individuals interested in counseling education-related discussion topics. After a follow up reminder one week later, 50 participants had submitted at least a partial response to the online survey.

The second source for participants came from a list of ACES membership list. Permission was obtained to use the rented list to contact list members regarding participation in the study. Representatives of ACES granted permission and contacted ACA membership services to prepare the list. The list ($N = 2,160$) contained counselor educators, counseling students, and other ACES members Another 447 e-mail addresses of counselor educators gathered from an online search of counselor education programs across the country were added to the ACES membership list. A final edit to delete any duplicate e-mail rendered a list of 2,607 potential recipients of the survey invitation.

Instrumentation

An adaptation of the *Perceptions of Computers and Technology* (PCT) survey (Hogarty, Lang, & Kromrey, 2003) was used with permission of the instrument's authors (see Appendix D) to measure the study variables. The questionnaire contained 106 items covering five domains: counselor educators' demographics, technology integration, confidence and comfort using computers, support of computer use, and attitudes towards computer use. The original survey instrument had been tested on teachers from elementary, middle, and high schools, and correlations "between instrument subscales and relationships with external variables provide[d] some initial support for the validity of the scores" (Hogarty et al., 2003, p. 158). Validity scores obtained using the adapted survey instrument in the current study were comparable to those reported in the validation of the original survey instrument.

Data collection and analysis

Participants responded to the survey questions online using a link provided in an e-mail solicitation to the survey contained on SurveyMonkey.com. Only 250 responses were sought for the current study; therefore, the online survey version was selected for ease of administration and data analysis. The online survey remained available for a 10-day period, and the survey collectors were closed after obtaining 344 responses. Analysis of the data and hypothesized path model involved validating the model's adherence to statistical assumptions applicable to multiple regression (Lea, 1997; Olobatuyi, 2006) and checking for multicollinearity issues with the variables (Inan & Lowther, 2010; Stage et al., 2004), and estimating the path coefficient values for each relationship among the variables studied.

Pre-analysis data screening resulted in the deletion of some of the 344 participant responses. Thirty-six responses were deleted because they were incomplete beyond the initial demographic questions, 14 were discarded due to a lack of response to the questions on technical support, and 41 others were not used because they did not provide a complete set of responses to the final sections of the survey. The final data set consisted of 253 complete responses.

Two concerns arose in the pre-analysis data screening that may have a significant effect on the results. First, the survey item designed to measure *number of computers available in the classroom for instruction* failed to differentiate between face-to-face classrooms and online environments. For example, counselor educators who indicated a face-to-face teaching modality were able to estimate the number of computers available in the classroom; whereas, educators teaching online seemed to have experienced confusion in how to respond to the question. Because the study was not designed to explore differences in teaching modalities, the PI decided to continue the data collection process as planned. The cost of obtaining another sample seemed to outweigh the hypothesized contribution of the specific question to the proposed path model's fit. The inclusion of *number of computers available in the classroom* for instruction allowed estimation of the original hypothesized path diagram, but it limited the generalizability of the study findings. Therefore, *number of computers available in the classroom* was excluded from subsequent path estimates in the parsimonious model.

The other concern encountered during the pre-analysis data screening involved *years using computers in the classroom for instruction.* Several respondents ($N = 13$) provided responses higher than their response to *number of years teaching in higher* *education*. It is possible that some participants have teaching experience outside the higher education environment and included their computer use in their response to how many years they had been using computers in their teaching practice. One respondent contacted the PI and provided feedback confirming this hypothesis. It is also hypothesized that some respondents interpreted *years using computers in the classroom for instruction* hurriedly and offered the number of years they had been using computers in the classroom for their own learning. In either case, this variable was excluded from the path diagram; however, *years teaching higher education* was included. Implications of these two concerns are addressed in the final section of the study.

Results

Respondent sample

The counselor educators who responded completely to the survey ($N = 253$) were between 26 and 71 years of age ($M = 47.6$, $SD = 11.99$). Sixty was the most frequent response to the question on age ($N = 17$) in the study. All age ranges seemed evenly represented in the survey when grouped by decades (e.g., 20 to 29 yrs., 30 to 39 yrs., etc.). More women ($N = 157$) than men ($N = 95$) responded, and a majority of participants, 80.6%, identified themselves as White/Non-Hispanic/Caucasian. Most reported a doctorate as their highest degree earned ($N = 199$). The majority of survey participants, 76.7%, earned their highest degree in Counseling ($N = 58$), Counselor Education ($N = 68$), or Counselor Education and Supervision ($N = 68$).

Participants responded as to whether they taught face-to-face, online, or both. Of the counselor educators who responded to the question ($N = 229$), 80.2% indicated they spent most or all of their time teaching face-to-face. Only 9.5% ($N = 24$) of participants reported teaching mostly or fully online.

Estimated path model

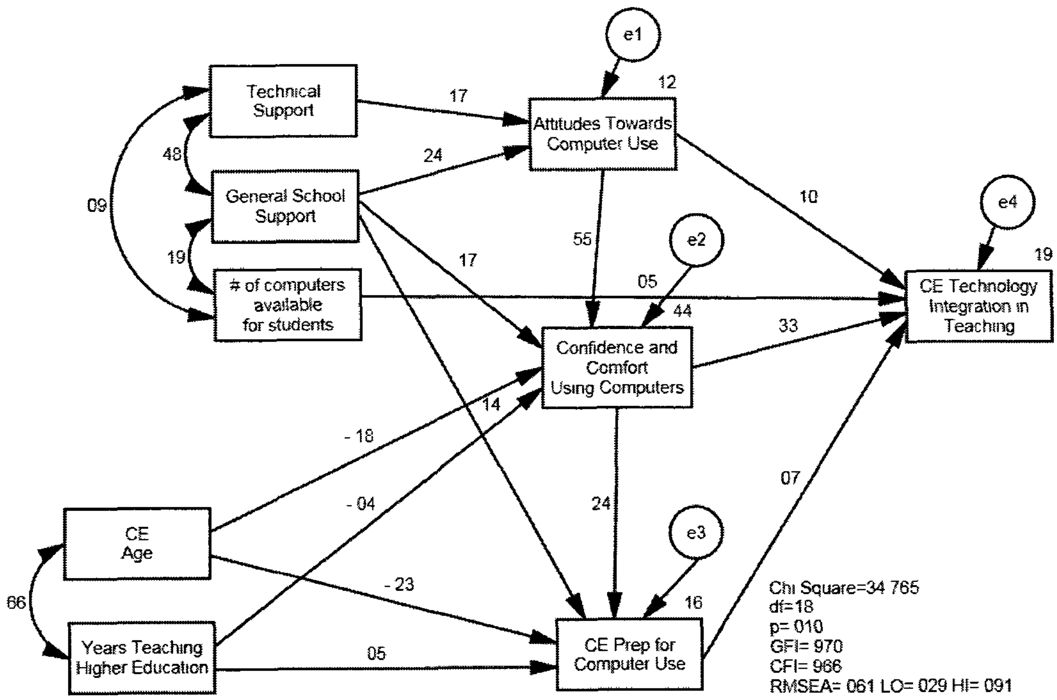

Figure 2. Estimated path model

The estimated path model in Figure 2 contains the calculated path coefficients and estimated amount of variation of each endogenous variable explained by other variables. Assessing the model's fit to the data involved estimation of parameters, or the Beta coefficients that describe the relationships among the study variables. Prior to the development of sophisticated structural equation modeling software, the only way to test a model's fit was to calculate the reproduced correlation coefficients manually through path decompositions. AMOS provided several ways to assess model fit through a variety of indices that compared reproduced correlations to empirical correlations. For the

Table 1

Standardized Estimates of Independent Variables

	Standardized estimates (Endogenous variables)											
	Attitudes toward computer use			Confidence & comfort using computers			CE prep for computer use			CE technology integration in teaching		
	Effect			Effect			Effect			Effect		
Independent variables	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Age	-	-	-	.181	-	.181**	.227**	-.043	-.271	-	-.079	-.079
Years Teaching	-	-	-	-.036	-	-.036	.048	-.009	.039	-	-.009	-.009
Technical Support	.166	-	.166	-	.092	.092	-	.022	.022	-	.050	.050
General School Support	.240	-	.240***	.169	.133	.302***	.142	.073	.215	-	.141	.141
Computer Availability	-	-	-	-	-	-	-	-	-	.054	-	.054
Attitudes Toward Computer Use	-	-	-	.554	-	.554**	-	.133	.133	.104	.194	.298
Confidence & Comfort Using Computers	-	-	-	-	-	-	.241	-	.241**	.333	.017	.350**
CE Prep for Computer Use	-	-	-	-	-	-	-	-	-	.071	-	.071
R^2			.123			.438			.160			.194

*$p < .05$.
**$p < .01$.
***$p < .001$.

current study, chi-square, goodness-of-fit index (GFI), Bentlers' comparative fit index (CFI) and root-mean-squared error of approximation (RMSEA) were used to assess model fit to the data (Marcoulides & Hershberger, 1997). Table 1 contains the standard estimates of endogenous variables.

A chi-square test for goodness-of-fit requires obtaining a significant χ^2 value ($p <$ .05); however, the null hypothesis is the desired outcome for χ^2 goodness-of-fit comparison of the estimated and parsimonious models. In other words, a non-significant χ^2 value is desired in order to demonstrate that the reproduced variance/covariance matrix does not significantly differ from the observed variance/covariance matrix (Browne & Cudeck, 1993). However, it is well known that tests of significance react to larger sample sizes; therefore, significance of the test may not necessarily mean a poor fit to the data (Marcoulides & Hershberger, 1997), and other measures of fit should be considered.

For the GFI and CFI, values above .950 indicate a good fit, and for RMSEA, values of less than .05 indicate a good fit, while values between .06 and .08 suggest an acceptable fit of the model to the data (Browne & Cudeck, 1993; Marcoulides & Hershberger, 1997). The fit indices for the estimated path model were $\chi^2(18, N = 253) =$ 34.765, $p = .010$, GFI = .970, CFI = .966, RMSEA = .061. The proposed model as tested also provided an acceptable fit according to the chi-square test and RMSEA value; with a stronger indication of being a good fit based on CGI and CFI values obtained. Further regression analyses on possible relationships among the variables resulted in a parsimonious model with a better fit to observed variances and covariances.

Parsimonious path model

One goal of path analysis is provision of a parsimonious model. The original hypothesized model exhibited an acceptable fit to the data, but elimination of insignificant paths resulted in a concise model with a better fit. The parsimonious model can be used in future tests using new data in order to assess the model's predictive accuracy (Marcoulides & Hershberger, 1997). The reduced path model presented in Figure 2 emerged after elimination of the variables number of computers available in the classroom for instruction and years teaching higher education due to their lack of significant effect on other variables under study. The fit indices for this model were $\chi^2(9, N = 253) = 7.190$, $p = .617$, GFI = .992, CFI = 1.000, RMSEA = .000. All indices indicate this model represents a good fit to the data and a more efficient and concise working path diagram. Standardized regression weights (provided in Table 2) were all significant ($p < .001$, or $p < .05$).

The model accounted for 12.3% of the variation in attitudes toward computer use, 43.6% of the variation in confidence and comfort using computers, 15.7% of the variation in preparation for computer use, and 19.9% of the variation in technology integration in the classroom. Regarding the research question of the effect of study variables on technology integration in teaching by counselor educators, confidence and comfort using computers exhibited the largest direct effect on technology integration in the classroom ($\beta = .383$), mainly due to the significant direct effect of attitudes toward computer use on confidence and comfort using computers ($\beta = .559$). The variables attitudes toward computer use ($\beta = .214$), general school support for using computers ($\beta = .115$), technical support (β = .036), and age (β = -.049) exhibited the largest indirect effect on technology integration in the classroom respectively.

Table 2

Standardized Regression Weights (Parsimonious Model)

	Final model	
Path	β	Significance level
General School Support for Computers → Attitudes Toward Computer Use	.240	***
Technical Support → Attitudes Toward Computer Use	.166	p = .013
Age → Confidence and Comfort Using Computers	-.205	***
General School Support for Computers → Confidence and Comfort Using Computers	.166	***
Attitudes Toward Computer Use → Confidence and Comfort Using Computers	.559	***
Age → Preparation for Using Computers	-.196	***
General School Support for Computers → Preparation for Using Computers	.146	***
Confidence and Comfort Using Computers → Preparation for Using Computers	.237	p = .018
Confidence and Comfort Using Computers → Technology Integration in Teaching	.383	***
General School Support for Computers → Technology Integration in Teaching	.132	p = .028

*** $p < .001$.

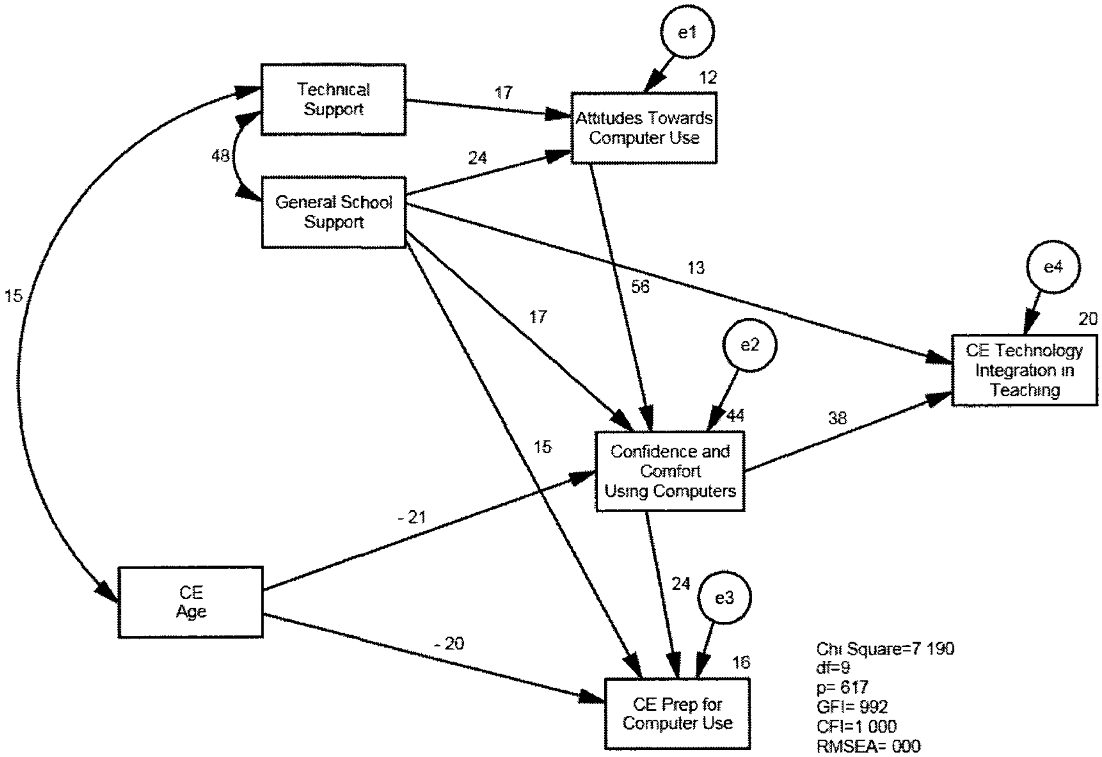

Figure 3. Parsimonious path model.

Discussion

The exogenous individual characteristics explored in this study were age and years teaching higher education. Age seems to affect only two study variables significantly and directly: confidence and comfort using computers and preparation for computer use. Counselor educators' age indirectly affects technology integration, but the effect is mitigated by confidence and comfort using computers. As age increases, counselor educators seem to express less confidence and comfort using computers. They also report being less prepared for computer use. The direct effect of confidence and comfort using computers on technology integration in teaching seems weakened in part by the negative effect of age.

Similarly, the inverse relationship of age and preparation for computer use seems strong enough to reduce the overall benefits of preparation for computer use when it comes to actual use of technology in the classroom. For example, as older counselor educators attend seminars or workshops on computer use, they may not be inclined to put their knowledge to use due to a lack of confidence or self-efficacy. Mandatory attendance at computer training, workshops, or departmental in-service training on a compulsory basis may impart computer skill and instruction; however, a side effect of mandatory training could be a decrease in attitudes toward computer use. Attendees may decide to resist implementation of any knowledge and skills acquired in the training event.

The significant influence of attitudes toward computer use on counselor educators' confidence and comfort using computers, the largest direct effect of a study variable on any other study variable, may explain why the benefits of preparation for computer use do not always materialize. Some counselor educators may feel forced to attend technology training, may not see the benefit of learning technology and how it can help them, or may feel they do not have the time or motivation to gain competency in technology integration. They may therefore demonstrate resistance to technology integration by focusing on barriers to applying what they may have learned. Again, age of the counselor educator may amplify resistance behaviors in older counselor educators, making them appear technophobic. These educators may be given stigmatic labels such as laggards or Luddites, thus supporting an adversarial relationship with technical support, instructional design departments, or administration. Such an adversarial relationship diminishes the effectiveness of professional development courses.

Attitudes toward computer use also demonstrated the strongest indirect effect on technology integration. This study explained only 12% of the variation in attitudes toward computer use; therefore, more research is needed to understand other influences on this variable. For example, a counselor educator may hold a resistant attitude toward implementing some new educational technology; however, in order to keep a teaching appointment, decide to go ahead and "do what must be done" in order to remain in the classroom. In this case, the negative effect of attitude is mitigated by the need for job security. The counselor educator's overall attitude toward problem solving may be a powerful factor affecting his or her specific attitude toward computer use. A highly positive outlook toward problem solving as a fun or stimulating activity may result in a highly positive view of learning new educational technology. Other variables, such as age, may interact with these yet unexplored variables to affect counselor educators' attitudes toward computer use.

Age and technical support share a significant covariance ($r = .15, p < .01$). Older counselor educators seem to express more positive views of technical support. This increased positive outlook on technical support may be linked to more frequent successful use of technical support services. It is also possible that counselor educators who report lower levels of confidence and comfort using computers may seek out and rely upon technical support more often. In either case, older counselor educators rate technical support more highly than their younger peers, but older counselor educators demonstrate a corresponding lower level of confidence and comfort using computers, as previously discussed. The significant inverse effect of age is not observed with respect to counselor educators' attitudes toward computer use. Study findings concerning the lack of significant effect by age on attitudes toward computer use are consistent with those reported by Broady et al. (2010).

Technical support and attitudes toward using computers share a significant positive correlation, and attitudes toward computer use has the largest significant direct effect on confidence and comfort using computers. Technical support may therefore serve as a mitigating factor for older counselor educators. Though the indirect effect is small, better technical support and general support for computer use may improve counselor educators' attitudes toward computer use, which may improve their confidence and comfort using computers.

Findings suggest that the more teaching experience counselor educators report, the more confident and comfortable they feel in using computers. Experience and time seem to play an important role in a counselor educator's level of self-efficacy in computer use. Self-efficacy has a powerful effect on the learning process (Bandura, 1997). Confidence and comfort using computers provided one measure of self-efficacy for counselor educators regarding computer use in the classroom. In this study, counselor educators' confidence and comfort using computers directly affected technology integration more than any other variable studied. Although this finding does not provide new information regarding the impact of confidence on the learning process, it does provide valuable insight into how to improve the ability of counselor educators to learn new technology. For example, an individual encountering a new educational technology, such as smart board—a technology that combines a white board, short-throw projector, and a computer interface and software program to create an interactive white board a teacher can control with an electronic pen—may feel overwhelmed by all of the equipment and software. The teacher may see no hope of ever mastering such a complex technology in the classroom. Oftentimes, the technical trainer may try to reassure the teacher that the technology is "easy to use" and begin to demonstrate how easy the trainer can maneuver the program; however, the teacher's feelings of anxiety only increase as he or she watches the trainer speeding through complex menus and commands. In this case, the teacher will probably not put forth the effort to learn to use the smart board system in the classroom.

The trainer might be more successful by first focusing on helping the teacher build confidence by allowing the teacher to experiment with the technology. For example, rather than telling the teacher how to create a new document, the trainer could ask the teacher, "As you look at the menu choices available, which of the menus shown would be your top two choices for where you most likely would find the command to create a new document?" This process engages teachers interactively and sets them up for success by giving them the possibility to make two guesses. By giving the teacher a way out if he or she guesses incorrectly, the trainer allows the teacher to maintain a level of comfort during the learning process, which in turn may increase the teacher's confidence. As educators become more confident and comfortable with technology, they are more likely to be better prepared to use it.

In the hypothesized path diagram, preparation for computer was expected to exert a significant influence on technology integration; however, no significant effect was demonstrated in the study. The lack of significant effect of preparation for computer use on technology integration may be due to the relatively large unexplained variation, approximately 84%, in preparation for computer use. Preparation for computer use did seem to mediate the negative effect of age on technology integration. The full effect of preparation on technology integration may yet be unaccounted for without the inclusion of missing factors, such as pedagogy, actual technology competency, or teaching load.

Although some counselor educators may be self-supporting when it comes to technology, counselor educators need to have quality technical support from their educational institution. However, even high-quality support may not have a significant direct effect on technology integration in the classroom if it is not readily accessible. For example, a counselor educator experiencing difficulty getting a 2-minute video clip to play correctly cannot afford to take time to contact technical support for assistance. The counselor educator will most likely move on without the clip or ask a student to help. General support for computer use may play the more important role in technology integration in similar situations.

General support for computer use demonstrated the greatest overall influence within the path model. Institutional culture may contribute to this great influence. Some institutions discourage the use of technology in the classroom, while other institutions actively support and encourage adoption of the latest technology. Companies such as Google and Facebook have received praise for their support of family needs within their corporate culture. Highly flexible work schedules, onsite shopping, and other benefits help create a relaxed work environment designed to promote greater creativity in the workplace. Technology becomes fun, rather than mundane work or a stressful challenge. This type of work environment might rarely exist in an educational institution, but efforts to move institutional culture in this direction might afford educators a workplace more conducive to experimenting with new educational technologies. Such a change in academic culture could have far-reaching positive implications for teachers and students.

Implications

The findings of this study have many implications for the counselor education programs, technical support, faculty development staff, and counselor educators.

Counselor education programs

This study provides valuable insight for counselor education programs in attracting, hiring, and retaining counselor educators who practice technology integration. Programs could use a brief survey to assess prospective educators' attitudes toward computer use and corresponding confidence and comfort in using computers in order to improve the chances of selecting someone who will integrate technology in the teaching process. Counselor education programs that provide valuable general school support for computer use along with a culture that embraces technology in all aspects of counselor education can improve their chances of attracting educators committed to the effective use of technology in teaching. Opportunities for successful technology integration improve for programs with a culture that incorporates a positive forward-thinking attitude toward using technology in the classroom. As programs explore new ways to implement existing computer hardware and software, newer technology such as the i-Pad, smart boards, student response systems, and wireless technology, the culture will continue to encourage confidence and comfort in using technology. Programs that want technology integration, but do not actively seek to understand and change current cultural mores regarding technology, may find adoption of technology difficult. For example, younger "digital native" faculty may have a stronger desire to explore and to adopt new classroom technology than older "digital immigrant" administrators and meet resistance because "this is the way it has always been done." Setting the tone at the top for technology use is vital to the successful integration of educational technology in the classroom.

Professional organizations for counselor education, such as ACES and CACREP, should consider strategies for improving counselor educators' attitudes toward computer use and their confidence and comfort using computers. This study highlights the important role attitudes and confidence play in self-efficacy of counselor educators regarding technology use. The CACREP 2009 standards were written in such a way as to encourage and not limit the adoption of technology in face-to-face, blended, and fully online classrooms. In other words, CACREP has not limited technology to distance learning environments, neither has CACREP dictated specific technology that should be used. ACES may benefit from adopting the same type of stance; however, such a stance may prove more difficult to achieve because someone must delineate outcome measures for counseling students, counselor educators, and counselor education programs. The problem with specifying outcome measures regarding technology is that by the time the measures are published, they are already out of date.

Another problem with providing specific technology competencies for students, educators, and programs is the vast continuum of current competency that exists. For example, some students are far ahead of educators in technology competency. Likewise, counselor education programs differ greatly in technology integration from those that still use VHS technology in counseling labs to those that stream video of counseling sessions via a secured virtual private network. One can see how difficult standard setting can be with such developmental continuum for students, educators, and training programs.

Technical support and faculty development

Efforts to improve counselor educators' attitudes toward computer use and their confidence and comfort using computers, as compared to an emphasis on computer training classes or workshops, will most likely have the greater influence on whether technology integration in the classroom. Faculty development courses in technology that do not seek to increase counselor educators' attitudes toward computer use or confidence and comfort using computers could be less effective than courses focusing on improving these influences on self-efficacy. Counselor educators who use technology in the classroom do so mainly because they feel confident and comfortable using the technology. The goal of faculty development efforts seems directed toward improving preparedness for using computers, which may have an indirect effect on the confidence level of the counselor educator; however, the findings of this study suggest that this indirect effect is insignificant in promoting technology use in the counselor education classroom.

Programs that spend more effort on technical support and skills training should consider redirecting resources into ways of improving attitudes and confidence levels of counselor educators. Providers of computer or technology training can benefit by integrating some basic counseling skills into the process of technology training for counselor educators. For example, computer workshops often have attendees at various levels of skill and comfort in using computers. Those who are experienced may become bored or ask advanced questions during the training, while computer novices or those who lack confidence in using computers may feel left out. By using active listening skills, building empathy, reflecting meaning, and other basic counseling skills, training providers may be more effective in discerning the technology culture of the counselor educator, building rapport with them, and encouraging feelings of self-efficacy necessary for effective learning.

Too often, it is easy for the technical trainer or support staff to overwhelm a trainee by simply doing what the trainer does best: using technology quickly, efficiently, and effortlessly. For instance, those who do not adopt technology are often labeled *technophobic*. A counselor working with a client who had a phobia would know the importance of building an empathetic relationship with the client before attempting many of the interventions that would normally be helpful in alleviating the client's fears. In the case of a counselor educator with technophobia, the trainer or workshop presenter should strive to build empathy with the counselor educator. If the trainer fails to connect with the technophobic counselor educator, the trainee leaves with feelings of inadequacy and intimidation, exiting the training experience with minimal learning. Technical trainers and support staff could increase their effectiveness in preparing counselor educators to use technology in the classroom by using effective communication skills in the training process.

Counselor educators who have more positive attitudes toward using computers will be more likely to feel confident and comfortable in putting the technology to use in the classroom, especially if they are surrounded by higher levels of technical support and general school support for computer use. Improved attitudes toward computer use and higher levels of confidence and comfort using computers may compensate for deficiencies of counselor educators' preparedness, training for computer use, or lower levels of available technical support.

Counselor educators.

Counselor educators desiring to improve their technology integration need to spend time understanding the benefits of staying current with educational technology. On one hand, counselor educators who take time to play with new technology to see what it can do can reduce or alleviate negative attitudes and feelings toward the technology. On the other hand, those who conceptualize all technology as "more work" may experience an increase in negative attitudes and feelings toward technology, leading to more stress and less career satisfaction. Counselor educators can increase positive feelings about technology integration by self-application of the same counseling skills they would teach to students or use with clients.

The best way for counselor educators to increase the integration of technology in their teaching environment is by finding ways to improve their attitudes toward using computers and increasing their levels of confidence and comfort using computers. Although being more prepared may impact both their attitude and confidence or comfort levels, study findings indicate a minimal overall impact of preparation for computer use on actual technology integration overall. Having support for computer use from fellow faculty and staff has the strongest effect on counselor educators' attitudes toward computer use, confidence and comfort using computers, and overall technology integration. Counselor educators wanting to improve their technology integration should seek teaching appointments in institutions that have a culture that supports and encourages the use of technology in teaching. Supportive environments allow adequate class release time to allow the counselor educator opportunities to explore and to learn new educational technologies without pressure. Although training is important, people often report learning technology best by "playing around" as opposed to having to take a class.

Limitations

Although care was taken in the design and execution of the study, certain limitations may affect the interpretation and generalization of survey findings. First, survey questions asking for the number of computers available in the classroom for instruction and for number of years using computers in higher education for instruction seemed to cause confusion for respondents. A few counselor educators expressed difficulty in responding to these questions because they taught either partially or wholly in an online environment; or, they may have included the number of years they used computers in the classroom for learning. Future research should make appropriate clarifications to these questions in order to control for such limitations.

Second, the study does not include a representation of participants who do not use e-mail or have Internet access to online surveys. Such participants might have provided information that differed from current study participants. Getting more in-depth answers to what could be viewed as apparent resistance to integrating technology by those who chose not to respond could lead to better technology training methods. Counselor educators not subscribed to the CESNET listserv may not have been represented in the survey, unless they responded to the email invitation sent to the current ACES membership list.

Third, self-report measures using a Likert scale offer no common standards by which to measure either the magnitude or existence of variables studied. For example overstatement and understatement of actual technology competency level often occurs in self-report measures of characteristics otherwise objectively measurable. Finally, the study did not include all potentially influential factors on counselor educators' technology integration. Individual-level factors including teacher computer proficiency and teaching load were excluded from the current study; however, some studies have suggested they may exert influence on teachers' technology integration (e.g., Inan & Lowther, 2010; Meyer & Xu, 2009). Inclusion of these variables may further explain technology integration in the classroom.

Recommendations for future research

This research represents the first path analytical study that has investigated intrinsic and extrinsic factors affecting counselor educators' technology integration in the classroom. Future research into technology adoption and diffusion in counselor education should include research methodologies that can explore the nonstatic nature of technology with counselor education (Choudrie & Dwivedi, 2005). Qualitative or mixed-methods designs might provide a multidimensional look at the factors influencing effective integration of technology in the counselor education process. Additional research should also include other variables with potential influence on technology integration by counselor educators.

More research is needed to understand how counselor educators' personal innovativeness affects their technology integration in the classroom. Counselors must be able to view problems from different perspectives in order to assist clients, and counselor educators need the same skill in helping counselor trainees find solutions in working with clients. Personal innovativeness is a trait that enables one to see problems and challenges in new ways and, thus, see new solutions. For example, some counselor educators may view learning computer technology as a "struggle to be endured," while others may view learning new technology as a "challenge to be taken on."

Future research should include a variable encompassing the perceived level of technology competence of counselor educators. A greater need may be to explore the actual level of technology competence of counselor educators using more objective methodology than self-report assessments. Although some research has explored technology integration by counselor educators within specific settings, such as within school counseling (Holcomb-McCoy, 2005; Rainey, McGlothlin, & Miller, 2008; Sabella et al., 2010), more research is needed to explore other settings in which counselors work (Myers & Gibson, 1999). Still, additional research could further explore the effects of counselor educators' individual characteristics on their technology use. For example, gender and ethnic characteristics may influence technology use (Jackson, von Eye, Fitzgerald, Zhao, & Witt, 2010).

Research that matches counseling students' perceptions of technology integration in their classes to responses to similar questions asked of their professors would offer great insight into the congruence of educator and student perspectives of integrated technology in the classroom, whether face-to-face or online. Including some measure of effectiveness of technology integration seems necessary for stakeholders in counselor education in order to determine best practices for technology use in teaching. Although educators may report effective integration of technology in the classroom (Lundberg, 2000), evidence to support the use of technology in the classroom for more than information acquisition and recall seems limited (Lim & Chai, 2008). Such limited application of technology integration in the classroom could have many causes.

Teaching style, commonly referred to as pedagogy, may play an important role in technology integration in the classroom. Counselor educators can choose from a variety of pedagogical frameworks in teaching (Fong, 1998), and effective integration of technology may require a rethinking of teaching style or pedagogy (Ascough, 2002; Ertmer, 2005; McWilliam, 2008). Further research could provide insight into the current pedagogical practices of counselor educators (D. H. Granello & Hazler, 1998; Judson, 2006; Nelson & Neufeldt, 1998; Sexton, 1998) and offer suggestions as to the effectiveness of specific approaches such as transformative teaching and learning (Kitchenham, 2006; Meyers, 2008) or a developmental approach (Mills & Tincher, 2003) on technology integration. Research has suggested students have preferred learning styles (Grasha & Yangarber-Hicks, 2000) just as teachers have a preferred teaching style. Further research designed to explore counselor educators' preferred learning styles and teaching styles regarding technology could provide results leading to the inclusion of other influential factors affecting technology integration in the counselor education classroom.

Finally, replication of this study using the pencil-and-paper form of the survey instrument might provide a broader picture of counselor educators' technology practices because of significantly higher response rates (Hogarty et al., 2003). A pencil-and-paper version may also capture the responses of those who do not use technology.

Conclusion

This study explored the effects of individual and institutional-level factors on counselor educators' integration of technology in their teaching environments. Based on previous research of technology integration in K-12, secondary, and postsecondary environments, the study fills a gap in the literature by providing the first known research-based path model describing some of the factors that affect counselor educators' integration of technology in the classroom. The hypothesized path model was estimated and revised to reflect the significant factors affecting technology integration. Study findings suggest that counselor educators' confidence and comfort using computers plays the most significant direct role affecting technology integration in the counseling classroom and that general school support for computer use significantly affects confidence and comfort levels of counselor educators regarding their use of computers. The only significant negative influence on confidence levels seems to be counselor educator age, which also negatively influences their preparation for computer use. These findings provide important implications for counselor education programs, counselor educators, and technical support departments.

Counselor education programs, along with counselor educators and technical support staff, can best influence technology integration in counselor education by efforts aimed at increasing counselor educators' confidence and comfort using computers or self-efficacy. Technology integration in counselor training is important for several reasons. Counselors need to understand how technology affects their clients' lives. Professional organizations such as ACES and CACREP encourage the development of technology competency by counseling students; therefore, counselor educators must develop and maintain a high level of technology competency themselves. Because more counselor education programs are turning to distance education delivery to prepare counselors, more research is needed to understand the complex nature of effective technology integration in the counselor education process.