MENTAL HEALTH MOBILE APPLICATIONS IN
COUNSELOR EDUCATION

by

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MENTAL HEALTH MOBILE APPLICATIONS IN COUNSELOR EDUCATION

Marlene Lynette East

Mental health mobile applications (MHMAs) are providing new forms of psychoeducation and interventions. Along with the emergence of MHMAs comes the need for diligence in ensuring safety, protecting privacy, and maximizing benefits. As providers of foundational training for future mental health practitioners, university counseling programs prepare counselors for all aspects of practice, including mental health technologies. The use of MHMAs in counselor education was investigated in this mixed methods study. The conceptual basis was a theory triangulation approach using theories of technology use and acceptance and diffusion of innovations. Three central research questions guided the study: (a) What factors influence counselor educators’ values of MHMAs as therapeutic tools? (b) What factors influence counselor educators’ behavioral intentions to teach counseling students about MHMAs? and, (c) To what extent are graduate counseling-related programs contributing to future counselors’ technological competence particularly regarding their ability to evaluate and integrate MHMAs? Participants were 132 professors from 99 university counseling programs. Participants completed an initial survey, an evaluation of an evidence-based mental health mobile application (app), and a postmeasure. Hierarchical multiple regression, ANCOVA, independent samples t-tests, and paired samples t-tests were used to analyze quantitative data. Results indicated that unified theory of acceptance and use of technology (UTAUT) variables along with anxiety/apprehension and ethical concerns are related to behavioral intentions to teach students about mental health mobile apps. The multiple regression analyses indicated that taken
together, the variables investigated accounted for 51% ($R^2$) of the variance in behavioral intentions to teach students about mental health apps. Generational category and levels of online course offerings were not found to significantly influence personal app use of educators, behavioral intentions to teach students about MHMAs, or total values of MHMAs. Trialability, interaction with one MHMA, was significantly related to behavioral intentions to teach counseling students about MHMAs and total values of MHMAs. Semistructured video chat interviews were conducted and analyzed in the qualitative strand to add depth and explain quantitative findings. The mixed methods analysis indicated that qualitative findings both supported and contradicted specific quantitative findings. This study has implications for all stakeholders in the mental health profession.
CHAPTER I
INTRODUCTION

Advances in mobile technology are changing the face of psychological assessment and interventions across the globe (Miller, 2012; Morris & Aguilera, 2012; World Health Organization, 2011). The pool of one particular emerging technology, mental health mobile applications (MHMAs), is rapidly growing and providing new forms of psychoeducation and interventions on a myriad of topics, including dementia, anxiety, depression, relaxation, sleep, obsessive compulsive disorder, burnout prevention, stress management, mood tracking for medication monitoring, domestic violence, and posttraumatic stress disorder. With the rapid emergence of mental health technologies also comes the need for diligence in developing competence, ensuring safety, protecting privacy, and maximizing the benefits of innovations. As providers of foundational training for future mental health practitioners, university counseling programs have a key role in preparing counselors for all aspects of practice, including proper use of mental health technologies. MHMAs in counselor education were therefore investigated in this pragmatic study. A sequential explanatory mixed methods design was used for its ability to produce breadth and depth of analysis.

The mental health profession includes counselors, social workers, marriage and family therapists, addictions counselors, career counselors, school counselors, psychologists, and psychiatrists. For ease of understanding, the term counselor is used to refer to all of these mental health professionals. Mental health related ethics codes direct professionals to only do what is good for clients, to do no harm (American Counseling Association [ACA], 2014; American Psychological Association [APA], 2010), and to promote the dignity and worth of individuals (ACA, 2014; APA, 2010; National Association of Social Workers [NASW], 2008). Ethics codes
also direct mental health professionals to actively understand how to use technology resources to better serve clients (ACA, 2014). The Council for Accreditation of Counseling and Related Educational Programs (CACREP, 2009) Standards subpart IIF, requires counselor education programs to produce evidence of the “use and infusion of technology in program delivery and technology’s impact on the counseling profession” (p. 10). Furthermore, continuing education is to reflect current knowledge and emerging developments (APA, 2010; NASW, 2008) and counselors are to be open to and obtain training on new procedures (ACA, 2014). Educators of future mental health professionals are directed to provide instruction based on the most current knowledge (ACA, 2014; NASW, 2008), and to provide instruction on empirically based techniques, procedures, and modalities (ACA, 2014; CACREP, 2009).

Guided by these directives, it is imperative to understand how counselor education programs are training future mental health professionals to evaluate and integrate MHMAs into clinical practice. Relevant conceptual lenses for enhancing understanding are technology adoption and theories of use, along with theories regarding diffusion of innovation. This theory triangulation framework provided insight into factors influencing counselor educators’ views about providing instruction to students about MHMAs.

Prior to conducting the study, a peer review of instruments was conducted, followed by a pilot study. Reliability testing of instrument scales was employed, and appropriate adjustments were made to scale items. Participants in the quantitative strand were professors in graduate counselor education programs. Professors from masters- and doctoral-level counseling, social work, and psychology programs participated. Participants in the quantitative strand completed an initial survey, an evaluation of an evidence-based MHMA, and a post-MHMA evaluation survey. Semistructured interviews were used in the qualitative strand to add depth of information
regarding counselor educators’ perceived values of MHMAs as therapeutic tools and to identify concerns about the use of MHMAs. Consistent with guidance by Creswell and Plano Clark (2011), a mixed methods analysis was used to determine if and to what extent the qualitative data explained the quantitative results about MHMAs in counselor education.

**Conceptual Framework**

The conceptual basis was a theory triangulation approach using (a) the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003); (b) eHealth systems diffusion and use theories (Spil & Schuring, 2006), particularly innovation diffusion theory and the trialability concept (Horan, Tulu, & Hilton, 2006; Rogers, 2003); and (c) generational influence on use of technology (Prensky, 2001). Instruments were designed particularly for addressing MHMAs in counselor education and for measuring variables identified in the stated theories. An additional scale was added to measure the influence of ethical concerns on counselor educators’ perceived values of MHMAs and behavioral intentions to teach students about MHMAs. Although Venkatesh, Thong, and Xu (2012) updated the UTAUT to the UTAUT2, the latter is more consumer focused, and the added variables of hedonic motivation, price value, and habit are not particularly relevant for studying intentions of counselor educators to teach students about MHMAs.

According to innovation diffusion theory (Rogers, 2003), innovators and early adopters of an innovation are keys to that innovation’s being spread throughout a system. It follows that counselor educators may be thought of as technological leaders who have the power to influence the diffusion of MHMAs into the counseling profession. Equally so, counselor educators have the power to influence the lack of diffusion of MHMAs into the counseling profession. Therefore, in consideration of the potential of MHMAs to change psychological interventions
and the potential of educators to influence the spread of MHMAs, it was essential to analyze the perceptions and behaviors of counselor educators regarding this emerging mental health technology.

**Statement of the Problem**

The fast emergence of MHMAs has made it difficult for counselor education programs, counselors, and continuing education providers to keep pace with the myriad of related issues: public safety, therapeutic value, ethical concerns, therapeutic integration, and proper training of counselors in the evaluation and use of MHMAs. Counselor education programs accredited by CACREP (2009) are to infuse technology into training programs and ensure students understand the impact of technology on the counseling profession. Council on Social Work Education (CSWE, 2008) Educational Policy and Accreditation Standards subpart 1.2, acknowledges that education programs are contextually influenced by new knowledge and technology. CSWE accreditation standards, subpart 2.1.3, also directs social workers to critically appraise and integrate multiple sources of knowledge, prevention, and intervention and to engage in research-informed practice. Also, Association for Counselor Education and Supervision (ACES) (1999, 2007) offers Technical Competencies for Counselor Education. Even so, some studies have indicated deficiencies in educating counseling students about emerging and even existing technologies (Dickey, 2011; Flores, 2012; Orr, 2011). Such technology education deficiencies imply that professors in counselor education programs may be reluctant to use emerging technologies (Chandras, 2000; Prensky, 2001; Quinn, 2001). Dickey (2011) surmised that the deficiencies may be due to confusion and disorientation experienced by counselor educators regarding technologies.
With such technology education deficiencies, I wondered if professors were training future counselors to effectively integrate MHMAs as therapeutic tools. Prensky (2001) distinguishes between digital immigrants, people born prior to 1980 who were not born into the digital world but have, at some point later in life, adopted new technologies, and digital natives, people born into the net or digital generation after 1980: “The single biggest problem facing education today is that our digital immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language” (p. 2). I wondered if that statement made by Prensky more than a decade ago still holds true among counselor educators. In thinking about education and the many ways in which people learn, Bandura’s (1977) social learning theory and observational learning through modeling came to mind. Bandura (1977) said, “Most of the behaviors that people display are learned, either deliberately or inadvertently, through the influence of an example” (p. 5). Counseling professors, like all other educators, are role models (Orr, 2011; Tyler & Sabella, 2004). When professors demonstrate proficiency with techniques and technologies, and when they project the value of those technologies, students will be more likely to be oriented to and utilize those techniques and technologies in counseling practice (Rogers, 2003). If instructors are uncomfortable with or even uninformed of the value of MHMAs as therapeutic tools, they will be unlikely to teach students how to effectively evaluate and ethically integrate these tools into clinical practice.

Variables identified by the UTAUT to be direct influencers of a person’s behavioral intention to use a technology include performance expectancy and benefits, effort expectancy, social influence, and facilitating conditions. Although possibly encompassed within these influencers, ethical considerations have not been specifically measured in the most recognized technology acceptance and use theories. When considering adoption of emerging technologies in
the counseling field, however, ethical issues are highly relevant (Bullock, 2003). Across courses, counselor education programs embolden counselors to adhere to the principals of beneficence and non-maleficence: Counselors are to do what is beneficial to clients and are to do no harm to clients (ACA, 2014; APA, 2010). Against this backdrop, it was essential in this investigation to measure counselors’ ethical concerns and apprehension about MHMAs.

Clearly, the potential of the multitude of up-and-coming MHMAs to change the face of psychological assessment and intervention (Miller, 2012; Morris & Aguilera, 2012; World Health Organization, 2011) necessitates effective education regarding these innovations. Therefore, factors influencing counselor educators’ decisions to include (or not include) instruction on MHMAs in counselor training curricula needed to be identified. Moreover, with MHMAs’ emerging in the second decade of the 21st century, there is a dearth of research on the topic of counselor education and emerging mental health technologies: I aimed to help bridge the gap through this study.

**Purpose of the Study**

The purpose of this sequential explanatory mixed methods study was to investigate counselor educators’ perceptions of MHMAs and the extent to which counselor education programs are training future mental health professionals to evaluate and integrate MHMAs into clinical practice. The mixed methods design was selected for its ability to yield depth and breadth of insight by synthesis of quantitative data with qualitative data because either approach as a separate entity would likely be inadequate (Creswell & Plano Clark, 2011) to fully investigate the use of MHMAs in counselor education. A non-experimental comparative design was used in the first quantitative strand. Participants in the quantitative strand were professors in masters- and doctoral-level counseling, social work, and psychology programs. The objective of
this strand was to investigate the current state of counselor education regarding mental health technologies, counselor educators’ behavioral intentions to teach students about MHMAs, and counselor educators’ perceived values of MHMAs. This quantitative strand included a pre-MHMA evaluation survey, an evaluation of an evidence-based MHMA, and a post-MHMA evaluation survey. Participants completed online surveys through SurveyMonkey. The Statistical Package for the Social Sciences (SPSS) Version 21 was used to analyze data with descriptive and inferential statistics.

The purpose of the second qualitative strand was to investigate in depth the phenomena of counselor educators’ values of and concerns about MHMAs as therapeutic counseling tools. Ten semistructured interviews were conducted with counselor educators selected from the quantitative strand. Five digital immigrants and five digital natives (Prensky, 2001) participated. These 10 professors were from 10 different universities. Each region of the United States was represented. Four of the universities represented were private, and four were public. The remaining two professors were from universities with online counseling programs. Interviews were conducted using Microsoft’s Skype™ video chat feature and were recorded with an audio and video recording software program. Data were transcribed by TranscribeMe!, a service that transcribes text using voice recognition software. QSR International’s NVivo 10 for Windows qualitative data analysis software was used to code and categorize qualitative data.

The objective of the mixed methods synthesis of quantitative data with the qualitative data was to provide deeper insight into factors that influence counselor educators’ values of MHMAs and intentions to teach students about MHMAs than would be gleaned by either type of research data as a separate entity (Creswell & Plano Clark, 2011). Mixed methods questions were used to address if and how the qualitative data explained quantitative data about perceived
values of and intentions to teach about MHMAs and what results, if any, emerged from comparing the data from the two research strands. A final objective of this mixed methods study was to determine if enhancements are needed in counselor education programs regarding training future mental health professionals to effectively evaluate and maximize the use of MHMAs as therapeutic counseling tools.

**Research Questions and Hypotheses**

Three central research questions guided this study: (a) What factors influence counselor educators’ values of MHMAs as therapeutic tools? (b) What factors influence counselor educators’ behavioral intentions to teach counseling students about MHMAs? and, (c) To what extent are counseling programs contributing to future counselors’ technological competencies particularly regarding their ability to evaluate and integrate MHMAs? The quantitative research questions and hypotheses are followed by the broad qualitative research questions and then the mixed methods research questions.

**Quantitative research questions.** Nine quantitative research questions were investigated to address the main topic of MHMAs in counselor education. Alternative and null hypotheses are presented for each quantitative research question.

1. Are there relationships between each of the independent variables (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d) social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns and the dependent variable, average scores on behavioral intentions to teach counseling students about MHMAs when considering the moderating influences of (a) generational category, (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use?
H₁: There are relationships between average scores on each of the independent variables (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d) social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns and the dependent variable, average scores on behavioral intentions to teach counseling students about MHMAs when considering the moderating influences of (a) generational category, (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

H₀: There are no relationships between average scores on each of the independent variables (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d) social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns and the dependent variable, average scores on behavioral intentions to teach counseling students about MHMAs when considering the moderating influences of (a) generational category, (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

2. Is there a difference between the average number of health applications (apps) downloaded to the personal phones of digital immigrant counseling educators versus the phones of digital native counseling educators?

H₂: Digital native counselor educators will have a higher average number of health apps downloaded to their personal phones than digital immigrant counselor educators have downloaded to their personal phones.

H₀: There will be no difference in the average number of health apps downloaded to the personal phones of digital native counselor educators and the phones of digital immigrant counselor educators.
3. Is there a difference between the average number of MHMAs downloaded to the personal phones of digital immigrant counseling educators versus the phones of digital native counseling educators?

H₃: Digital native counselor educators will have a higher average number of MHMAs downloaded to their personal phones than digital immigrant counselor educators have downloaded to their personal phones.

H₀: There will be no difference in the average number of MHMAs downloaded to the personal phones of digital native counselor educators and the phones of digital immigrant counselor educators.

4. Are there differences between digital immigrant and digital native counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use?

H₄: Digital native counselor educators will have significantly higher average behavioral intentions to teach scores than will digital immigrant counselor educators when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use.

H₀: There will be no differences between digital native and digital immigrant counselor educators’ average behavioral intentions to teach MHMAs scores when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use.

5. Are there differences between digital immigrant and digital native counselor educators’ average values of MHMAs scores when considering the moderating influences of (a)
gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use?

H₅: Digital native counselor educators will have significantly higher average values of MHMAs scores than will digital immigrant counselor educators when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use.

H₀: There will be no differences between digital native and digital immigrant counselor educators’ average values of MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

6. Does level of online counselor educator course offerings influence counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

H₆: Level of online counselor educator course offerings will significantly influence counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

H₀: There will be no differences between level of online counselor educator course offerings and counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.
7. Does level of online counselor educator course offerings influence counselor educators’ average total values of MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

H₇: Level of online counselor educator course offerings will significantly influence counselor educators’ total values of MHMAs scores to teach counseling students about MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

H₀: There will be no differences between level of online counselor educator course offerings and counselor educators’ total values of MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

8. What is the effect of trialability on counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores? Restated, is there a significant difference between counselor educators’ average behavioral intentions to teach students about MHMAs scores before and after interaction with one evidence-based MHMA, the PE Coach app?

H₈: The average behavioral intentions to teach students about MHMAs scores will be significantly higher after interaction with an evidence-based MHMA, the PE Coach app.

H₀: There will be no difference in the average behavioral intentions to teach students about MHMAs scores before and after interaction with an evidence-based MHMA, the PE Coach app.
9. What is the effect of trialability on counselor educators’ average total values of MHMAs scores? Restated, is there a significant difference between counselor educators’ average total values of MHMAs scores before and after interaction with one evidence-based MHMA, the PE Coach app?

H₉: The average total values of MHMAs scores will be significantly higher after interaction with an evidence-based MHMA, the PE Coach app.

H₀: There will be no difference in the average total values of MHMAs scores before and after interaction with an evidence-based MHMA, the PE Coach app.

**Qualitative research questions.** Two broad research questions were investigated to explain the central phenomena of counselor educators’ values of and concerns about MHMAs as therapeutic counseling tools:

1. How do counselor educators perceive the value of MHMAs as therapeutic tools?
2. What are the concerns of counselor educators regarding the uses of MHMAs as therapeutic tools?

A protocol of questions was used for the 10 semi-structured interviews to answer these two broad qualitative research questions.

**Mixed methods research questions.** The mixed methods research questions were

1. Does the qualitative interview data explain the quantitative results about MHMAs? If so, how, and to what extent?
2. Did results emerge from comparing the quantitative survey data with the qualitative interview data on the topic of MHMAs in counselor education? If so, what results emerged from this comparison?
Significance of the Study

This study has significance for stakeholders in the mental health field: counselor educators, counseling students, counseling practitioners, and counseling clients. Accrediting organizations and professional associations may also use the findings to enhance technological competency standards and training for educators and practitioners. MHMAs were selected as the topic because of the dearth of research on MHMAs in counselor education, and for their relevance to my specialization in instructional and performance technology. In addition, this study has significance to international and national public health agencies who recognize the potential of MHMAs to increase access to mental health support and are positively influencing the growth in MHMAs through mHealth initiatives.

Additionally, this study offers valuable information to designers and developers of MHMAs. It is essential for developers to address complex and interacting factors that significantly influence counselor educators and counseling practitioners to use, teach, and recommend MHMAs. Marketers of apps will also benefit by developing a better understanding of which app features to highlight to the specific audience of counseling stakeholders.

Limitations and Delimitations of the Study

Counselor educators chose whether or not to participate in this study; potentially different perspectives may have been unidentified by not including data from counselor educators who chose not to participate, whether that decision was related to time constraints, lack of interest in the topic, or other personal reasons. One educator exited the survey noting that the race and ethnicity choices did not apply to her. She pointed out in personal correspondence that the federal recommended survey guidelines for race and ethnicity is the subject of much controversy and may lead to excluding the perspectives of people who do not identify with these categorical
guidelines. To deepen understanding, she recommended the book by Clara Rodriguez (2000), *Changing Race: Latinos, the Census, and the History of Ethnicity in the United States*. In addition, the questionnaire used in this study was a self-report instrument and, as such, the responses may be biased.

Delimitations, the boundaries set by this researcher, are also important to consider (Rudestam & Newton, 2007). First, the target population was limited to educators in counseling programs. Including additional stakeholders such as students, practicing mental health professionals, and counseling clients would likely have revealed different perspectives. The counseling education environment was selected as the target of study because education is pertinent to a doctorate degree in education and because counselor education is of interest to this researcher, a licensed mental health counselor. Second, the particular technology studied was MHMAs; findings from this study may not be applied to other counseling-related technologies such as electronic health records, distance counseling, second life simulations, or voice-to-text note-keeping software.

Third, educators who did not have smartphones were excluded from this study. Smartphone ownership was necessary in order to download and evaluate a MHMA. This delimitation led to a sample of highly similar participants who are early adopters of technology; this situation excluded the opinions of professors who are late adopters of technology. A fourth delimitation was the specific MHMA selected by the researcher for evaluation by the counselor educators. Evaluation of different apps or more than one app may have contributed to different results. The PE Coach app was selected for the evaluation in order to measure the influence of trialability on behavioral intentions to teach students about MHMAs and counselor educators’ perceived values of MHMAs as therapeutic tools. The PE Coach app was chosen based on the
existence of evidence-based research on the app and because it is designed to be used in conjunction with a therapeutic treatment modality. Another factor contributing to the selection of the PE Coach app was its credible developers, National Center for Telehealth and Technology (T2). Evaluation of non-evidenced-based MHMAs or even evaluation of other evidence-based MHMAs may have produced different results. A final delimitation is the conceptual lens of technology use and acceptance theories and diffusion of innovation theories. If the study had been conducted through the lens of self-efficacy theory or personality theory in relationship to adoption of technologies, completely different results would likely have been produced.

Definitions of Terms

Defined are the variables and other terms relevant to this study. Where appropriate, the terms technology and innovation are replaced with MHMAs in order to better connect the definitions to the scope of this study.

Anxiety. Anxiety is a state of being fearful or apprehensive when using or teaching students about MHMAs.

Association for Counselor Education and Supervision (ACES). ACES (1999, 2007) is a technology interest group focusing on the importance of technology in counseling. ACES advocates for technological competencies in counselor education programs.

Attitudes. Attitudes refer to the underlying value, belief, or disposition counselor educators may hold toward MHMAs. Concepts such as enjoyment, pleasure, and comfort level influence counselor educators’ overall attitude toward MHMAs.

Behavioral intentions. This dependent variable reflects counselor educators’ likelihood of engaging in teaching or using MHMAs. Behavioral intentions are included in theory of reasoned action (Fishbein & Ajzen, 1975); Theory of Planned Behavior (Ajzen, 1991);
technology acceptance model (TAM) (Davis, 1989); and in UTAUT and UTAUT2 (Venkatesh et al., 2003; Venkatesh et al., 2012).

**Behavioral intervention technologies.** Behavioral intervention technologies are “web-based and mobile interventions intended to support patients and consumers in changing behaviors related to health, mental health, and well-being” (Mohr, Cheung, Schueller, Brown, & Duan, 2013).

**Council for Accreditation and Related Educational Programs (CACREP).** According to the CACREP website, this organization was established in 1981 and promotes professional competence of counseling and related practitioners through the development of preparation standards, the encouragement of excellence in program development, and the accreditation of professional educational programs. Many state boards require graduate counseling degrees to be earned at CACREP-accredited counseling programs in order to qualify for licensure as a mental health professional.

**Counselor.** American Counseling Association (2005) defines a counselor as a professional (or a counselor-in-training student) who engages in roles such as educators, researchers, supervisors, practitioners, and consultants. In this study, the term counselor is used to include all mental health professionals such as social workers, marriage and family therapists, addictions counselors, school counselors, psychologists, and psychiatrists.

**Counselor educator.** ACA (2014), defines a counselor educator as “a professional counselor engaged primarily in developing, implementing, and supervising the educational preparation of professional counselors” (p. 20).

**Diffusion.** Diffusion is the process by which MHMAs are communicated through channels over time among the members of the counseling social system (Rogers, 2003).
**Digital divide.** The term digital divide represents the separation between individuals who are advantaged versus those who are relatively disadvantaged by the Internet. This term helps illuminate the understanding of inequality in the consequences of innovation (Rogers, 2003). Eysenbach (2001) adds to the understanding of the term, “The digital divide currently runs between rural vs. urban populations, rich vs. poor, young vs. old, male vs. female people, and between neglected/rare vs. common diseases” (p. 2).

**Digital immigrants.** Digital immigrants are people who were not born into the digital world but have, at some point later in life, adopted new technologies. Digital immigrants, however, retain an accent or a foot in the past. Digital immigrants were born prior to 1980 and are compared to digital natives born after 1980 (Prensky, 2001).

**Digital natives.** Digital natives are people born into the net or digital generation after 1980; they are often called *Millenials* or *Gen Y*. This generation speaks the digital language of computers, video games, and the Internet. Digital natives are accustomed to receiving information quickly. They like parallel processing and multi-tasking (Prensky, 2001).

**Effort expectancy.** Effort expectancy is the “degree of ease associated with consumers’ use of technology” (Venkatesh et al., 2012, p. 159). For this study, effort expectancy is the degree of ease associated with counselor educators’ use of MHMAs.

**eHealth.** eHealth is a field that intersects medical informatics, public health, and business. eHealth delivers health services and information through the Internet and related technologies. Regarding eHealth, Eysenbach (2001) says, “In a broader sense, the term characterizes…a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology” (p. 1).
**Emerging technology.** An emerging technology is an innovation that is not necessarily new as it may be established in one context (domain, place, or application), but is also emerging in another context. Technology is considered emerging when it is not widespread in a particular context and when it causes a radical change to business, industry, or society (Halaweh, 2013). MHMAs are emerging technologies.

**Ethical concerns.** MHMAs pose new challenges and threats to ethical issues such as online professional practice, informed consent, privacy, and equity issues (ACA, 2014; Eysenbach, 2001).

**Facilitating conditions.** Facilitating conditions represent counselor educators’ perceptions of the resources and support available to use MHMAs and to teach students about MHMAs (Venkatesh et al., 2012, p. 159).

**Innovation.** An innovation is an idea, practice, or object that is perceived as new by an individual or another unit of adoption (Rogers, 2003).

**Mental health mobile apps (MHMAs).** MHMAs are applications (apps) for mobile phones designed to assess, enhance, or improve mental health and behavioral health.

**mHealth.** mHealth refers to the use of mobile and wireless devices to improve health outcomes, healthcare services, and health research (World Health Organization, 2011) “including wireless diagnostic and clinical decision support” (Kumar et al., 2013, p. 228).

**Mobile technology.** Kumar et al. (2013) offer a definition of this term, “Mobile technology is defined as wireless devices and sensors (including mobile phones) that are intended to be worn, carried, or accessed by the person during normal daily activities” (p. 228).
Perceived benefits. Perceived benefits is an independent variable that represents counselor educators’ evaluation of control, freedom, newness, assimilation, and fulfillment of need as derived from the use of MHMAs (Mishra, 2011).

Perceived total values of MHMAs. The perceived total values of MHMAs score reflects counselor educators’ combined total scores on the variables performance expectancy/relevance, effort expectancy, and attitude.

Perceived usefulness. Perceived usefulness is the degree to which a person believes a particular innovation will enhance job performance (Davis, 1989). Perceived usefulness has been determined to be a highly important factor in determining healthcare professionals’ use of technology (Chismar & Wiley-Patton, 2002). For this study, perceived usefulness reflects the degree to which MHMAs will enhance performance as a counselor.

Performance expectancy. Performance expectancy is “the degree to which using a technology will provide benefits to consumers in performing certain activities” (Venkatesh et al., 2012, p. 159). For this study, performance expectancy is the degree to which using MHMAs will provide benefits to counselors in performing counseling-related tasks.

Principle of beneficence. Mental health professionals are required to safeguard the welfare and rights of clients, and they are to work for the good of society by promoting mental health and well-being (ACA, 2005, 2014; APA, 2010).

Principle of non-maleficence. Mental health professionals are to act to avoid harm to their clients, trainees, and research participants and are to minimize or remedy unavoidable or unanticipated harm (ACA, 2005, 2014; APA, 2010).

Relevance. Relevance is the degree to which counselor educators expect MHMAs to solve problems or contribute to goal attainment (Spil, Schuring, & Michel-Verkerke, 2006).
Relevance is similar to the notion of relative advantage as discussed by Rogers (2003). Being able to clearly discern the relevance of using MHMAs will positively influence the perceptions of the usefulness of MHMAs (Venkatesh & Davis, 2000).

**Social influence.** Social influence is the extent to which counseling educators perceive that important others in the mental health field believe that MHMAs should be used by counselor educators and counselors (Venkatesh et al., 2012, p. 159).

**Theory triangulation.** Theory triangulation is the use of more than one theory to understand the behavioral intentions of counselor educators to teach and use MHMAs (Plano Clark & Creswell, 2008).

**Trialability.** Trialability is the degree to which MHMAs may be experimented with on a limited basis; trialability offers the opportunity to learn by doing. MHMAs that may be easily tried will have more rapid rates of adoption than MHMAs that may not be easily tried (Rogers, 2003).

**Unified theory of acceptance and use of technology (UTAUT).** UTAUT is an empirical synthesis of eight influential technology use and acceptance theories. UTAUT proposes that behavior is influenced by intentions and facilitating conditions. Social influences and expectations of performance of effort shape intentions. Behavioral determinants are moderated by gender, age, experience, and voluntariness of use (Venkatesh et al., 2003).

**Voluntariness of use.** Voluntariness of use is a moderator variable representing the extent to which one perceives the decision to adopt the use of MHMAs as non-mandatory (Venkatesh & Davis, 2000).
Chapter Summary

This chapter introduced the research topic of counselor education regarding MHMAs, offered a justification for the need to study this topic, and provided a rationale for using a mixed methods research design. The conceptual basis of the technology acceptance and diffusion theory triangulation approach was presented. Counselor educators were defined as participants. Independent variables, dependent variables, covariates, research questions, hypotheses, and definitions of terms were outlined in relation to this design’s approach for addressing the three central research questions: (a) What factors influence counselor educators’ values of MHMAs as therapeutic tools?, (b) What factors influence counselor educators’ behavioral intentions to teach counseling students about MHMAs? and, (c) To what extent are graduate counseling programs contributing to future counselors’ technological competence, particularly regarding their ability to evaluate and integrate MHMAs? The significance of the study along with limitations and delimitations were also presented.
CHAPTER II
LITERATURE REVIEW

This study is about counselor education regarding emerging technologies, particularly mental health mobile apps (MHMAs). Relevant to this study is a deeper understanding of counselor education standards and technological competency in counselor education. No prior research about counselor education regarding MHMAs was located. Research discussed in the literature review, therefore, consists of studies located on general technological competence in counselor education and instructional training for other counseling-related technologies. The development of MHMAs, uses of MHMAs, research evidence on MHMAs, and technology adoption theories relevant to (non)adoption of teaching counseling students about MHMAs are also discussed.

University of West Florida (UWF) library databases were consulted including Academic OneFile, Computer Database, Computing (ProQuest), Dissertations and Theses Full Text (ProQuest), ERIC (ProQuest), General OneFile, JSTOR, Proquest Complete, PsycARTICLES (APA), Psychology Journals (APA), SAGE Premier Journals, ScienceDirect, Social Sciences Full Text, SpringerLINK (FCLA), and Wiley Online Library. In addition, relevant journal articles were accessed through the American Counseling Association’s Knowledge Resource Center and the Journal of Medical Internet Research. Search terms included but were not limited to counselor training, counselor education, counselor technological competence, CACREP, emerging mental health technologies, eHealth, mHealth, behavioral health apps, mental health apps, mental health mobile apps, mobile technology in psychology, mobile technology in psychiatry, technology use and acceptance, Venkatesh, UTAUT, Davis, TAM, Rogers, diffusion of innovations, and innovation diffusion theory (IDT). This literature review section concludes
with a summary. Research on counselor education, MHMAs, and technology use and acceptance theories is summarized. Connections between the research and this study on MHMAs in counselor education are explained.

**Counselor Education**

In this section of the literature review, counselor education will be discussed. Topics include types of instructional training, ethical standards, accreditation standards, and technology-related standards. Also discussed is research evidence regarding technological competence of counselors and generational influences on technological competence. The final topic covered in this section is the extent to which counseling-related professional associations are offering continuing education and professional development on MHMAs and other emerging mental health-related technologies.

**Types of instructional training for counseling related degrees.** Instructional programs provide various degrees for preparing students to become mental health researchers, teachers, and practitioners. Psychiatrists complete medical school and are taught to treat mental and physical aspects of psychological disturbance. They may order and perform testing and they provide a variety of treatments including psychotherapy. Psychiatrists, unlike most other mental health professionals, may prescribe psychotropic medications. According to the website for the American Psychiatric Association, the organization is the world’s largest psychiatric association with more than 35,000 members. Psychologists have doctoral degrees, conduct research, and apply knowledge to improve functioning of people, organizations, and communities. The APA (2015) website indicates a membership of 122,500 in the United States. Many psychologists conduct educational and psychological testing, participate in forensic psychology, and serve as expert witnesses in the judicial system. Licensure as a clinical psychologist requires graduation
from an APA-accredited doctoral-level educational program. The psychology doctorate degrees are Doctor of Philosophy in Psychology (Ph. D.), Doctor of Psychology (PsyD) and Doctor of Education (Ed. D.). The latter focuses heavily on research in counseling psychology.

Mental health professionals who may obtain state licensure with master’s degrees from accredited educational programs include licensed mental health counselors (LMHCs), licensed clinical social workers (LCSWs), licensed marriage and family therapists (LMFTs), and registered interns who are working toward one of the aforementioned licenses. LMHCs are called licensed professional counselors (LPCs) in some states. School counselors receive educational training similar to that of other master’s-level counselors, but typically, state licensure is not required. According to the ACA (2015) website, the ACA is an educational, scientific, and professional organization, with 55,000 members representing professional counselors in practice settings. Masters level counselor education programs designed to prepare students for future licensure as LMHCs, LPCs, LCSWs, or LMFTs will be addressed. Educational training for doctoral-level mental health professionals and education to prepare school counselors are not directly addressed by this study.

**Ethical standards for counselor education programs.** Both the ACA (2014) and APA (2010) cover counselor instructional preparation in their ethical codes. Although this study is aimed at master’s-level professional counselor training, which is primarily addressed by the ACA and CSWE (2008), the APA ethical code is also relevant. Most master’s-level counselor education programs provide instruction regarding the APA ethical code. In addition, many counselors choose to pursue doctorate degrees in APA-accredited education programs after receiving a master’s degrees.
ACA and APA guiding principles. Principles of autonomy, beneficence, non-maleficence, fidelity and responsibility, integrity, justice, and respect for people’s rights and dignity guide the ACA Code of Ethics and the APA Code of Ethics (Brennan, 2013; Kitchener, 1984). Therefore, counselor education programs, as well as counseling practices, are guided by these principles.

Principle of autonomy. Autonomy is freedom for self-exploration (Pedersen, 1997). Counselors are to promote autonomy in clients as opposed to promoting dependency on the therapist. Presenting all treatment options and explaining risks are matters of informed consent and promotion of autonomous behavior (Pantilat, 2008). Respecting clients’ goals and values are also included within the principle of autonomy (Brennan, 2013).

Principle of beneficence. The primary responsibility of counselors, according to ACA (2014) Section A, Counseling Relationship, “is to respect the dignity and to promote the welfare of clients” (p. 4). Counselors are obliged to take actions of benefit to and in the best interest of clients; they are obliged to help their clients (Brennan, 2013). Weighing benefits against possible risks of an action is included in the principle of beneficence (Pantilat, 2008).

Principle of non-maleficence. Section A of the 2014 ACA Ethical Code also states, “counselors act to avoid harming their clients, trainees, and research participants and to minimize or to remedy unavoidable or unanticipated harm” (p. 4). This principle is derived from the Hippocratic oath; according to Brennan (2013) this means, “even if treatment does not resolve a client’s problems, it should not make them worse” (p. 247).

Principle of fidelity and responsibility. Counselors are to honor commitments made to clients (Brennan, 2013), and they are to clarify, uphold, and accept responsibility for their behavior (APA, 2010). Fidelity includes honoring the trust that clients place in the counselor.
**Principle of integrity.** The APA (2010) Code indicates the importance of promoting accuracy, honesty, and truthfulness in science, teaching, and practice. ACA (2014) uses the term veracity, and specifically clarifies the need to be honest in conducting and reporting assessments and evaluations and in communications with the public and other professionals.

**Principle of justice.** Counselors are to respect the cultural and personal history of clients, are to treat all clients equitably, and are to refrain from discriminating against clients (Brennan, 2013). The ACA (2014) defines the ethical principle of justice in the Preamble to the Code of Ethics as “treating individuals equitably and fostering fairness and equality” (p. 3). Related core professional values in the ACA (2014) Code of Ethics Preamble include “honoring diversity and embracing a multicultural approach in support of the worth, dignity, potential, and uniqueness of people within their social and cultural contexts” (p. 3) and “promoting social justice” (p. 3).

**ACA and APA counselor education standards.** Section C of the ACA (2014), Code of Ethics Professional Responsibility, requires counselors to practice within the boundaries of their educational training and to acquire ongoing continuing education. Section C.2.b. indicates counselors are to practice in specialty areas new to them only after gaining appropriate education, training, and supervised experience. Counselors are required to properly represent their educational credentials. Section F, one of eight main sections in the ACA Code, is devoted to supervision, training, and teaching. The ACA requires counselor educators to be skilled educators and practitioners who maintain high ethical standards and demonstrate regard for student welfare and training. Counselor education programs are to “integrate academic study and supervised practice” (ACA, 2014, p. 14). According to Section F.7.a., counseling faculty are to serve as role models for professional behavior and are to approach counselor education as a developmental process. Section F.7.b indicates that counselor educators are to develop
competence in the technologies used for delivery of instruction. Regarding innovative theories and techniques, Section F.7.h. indicates, “counselor educators are to promote the use of techniques, procedures, and modalities that are grounded in theory and have an empirical or scientific foundation” (ACA, 2014, p. 14).

Similarly, the APA (2010) Code requires psychologists to operate within boundaries of educational training and to gain relevant educational training in new techniques or technologies. Psychologists may claim degrees as credentials for health services only if those degrees were earned from a regionally accredited organization or were the basis for state licensure. Section 7 of the APA Code is specifically dedicated to education and training of psychologists. This section is similar to the ACA (2014) Code of Ethics Section F.

ACA and APA technology-related standards. While the ACA (2005) Code of Ethics covers Technology Applications within Section A, The Counseling Relationship, the ACA (2014) Code of Ethics includes an entire section devoted to technology in counseling. This section of the newest code is most relevant to counselor education regarding MHMAs. Section H of the ACA (2014) Code of Ethics is entitled Distance Counseling, Technology, and Social Media (p. 17). This section recognizes that counseling is no longer limited to in-person, face-to-face interactions. This section provides clear guidelines for technology-related informed consent and disclosure, acknowledgment of limitations, confidentiality, security, identity verification, access, records, and rights. Thorough guidelines are provided for distance counseling, practice websites, accessibility, and security. Section E of the ACA (2014) Code is devoted to assessment. Counselors must have appropriate training in technology-assisted assessments and interpretations and must appropriately use these assessment technologies.
The APA (2010) Code does not devote a section to technology, but covers technological competence under the general competence section, Standard 2. This standard indicates, when planning to use a new technology, psychologists must undertake relevant education or training. Standard 2.01(e) addresses emerging areas for which preparatory standards do not yet exist; this section indicates that psychologists are to take reasonable steps to ensure competence of their work and to protect others from harm. The APA Code applies to activities across a variety of contexts, including the Internet and electronic transmissions.

Accreditation standards. The Association for Counselor Education and Supervision (ACES) developed standards for counseling programs in the late 1960s and early 1970s and joined with the American Personnel and Guidance Association (APGA), a pre-cursor to the ACA, to establish CACREP in 1981. The vision of CACREP, according to the organization’s website, is to provide leadership and promote excellence through accreditation of counseling programs. Selection of a CACREP-accredited education program assures students of a quality, stable, legitimate, and professional program. Furthermore, in order for counselors to obtain licensure to practice as mental health professionals, most state regulations require graduate degrees from CACREP-accredited instructional programs. Approximately 250 universities with counselor education programs are currently CACREP-accredited according to the online directory. Seven of the accredited universities provide online programs.

The currently used CACREP (2014) standards were published in 2009, however, the Standards Revision Committee (SRC) has created a working draft for 2016 standards, integrating feedback from the 2011 ACES conference and from accredited programs’ annual reports. The public was permitted to make comments on the draft until January 10, 2014. According to the SRC committee chair, the CACREP board will vote on the 2016 standards at a February 2015
meeting and will disseminate the standards in early summer 2015 (A. Milsom, personal communication, January 19, 2015).

**CACREP technological competency standards.** The CACREP (2009) standards mention technology in two areas. Section 2F requires evidence “of the use and infusion of technology in program delivery and technology’s impact on the counseling profession” (p. 10). The only other mention of technology in the 2009 version states that counselors trained in career counseling programs must demonstrate the ability to train others in the appropriate use of technology for career information and planning (p. 28). The proposed 2016 standards (CACREP, 2014) aim to recognize the ever-increasing influence of digital technology. In a standard for access to educational instruction, the 2016 draft indicates that counseling instructional environments are to include technologies.

An improvement in the 2016 draft, as compared to the 2009 standards, is the requirement to “provide evidence, gathered at multiple points and using multiple measures, of student learning” (CACREP, 2014, p. 6) in eight core areas. Technology’s impact on the counseling profession is covered under the core area of professional counseling orientation and ethical practice. Like the 2009 standards, the proposed 2016 standards cover the use of technology for career counseling. Also in the new proposed standards, assistive technologies to reduce or eliminate barriers are covered under education for rehabilitation counseling. Finally, the proposed 2016 standards for doctoral-level education require training in the use of technology in supervision.

**Association for Counselor Education and Supervision (ACES) technology-related standards.** In 1999, the Association for Counselor Education and Supervision (ACES) developed *Technical Competencies for Counselor Education Students: Recommended Guidelines*
for Program Development. This document was later revised and approved by the ACES (1999, 2007) executive council (Bullock, 2003; Burt, Gonzalez, Swank, Asher, & Cunningham, 2011; Chandras, 2000). The focus in the ACES (2007) competencies is infusion of technology into counselor education curricula in order to foster the development of technological literacy and to enhance counseling practice through application of technology. Master’s-level graduates are to demonstrate basic proficiency across 11 technological competencies by being exposed to various forms of technology including productivity software, audiovisual equipment, multimedia software, statistical software, computerized and Internet-based testing and career development, email, Internet psychoeducation, counseling-related listservs and professional communication applications, research databases, Internet continuing education information and courses, and basic computer operation. In addition, graduates are to be knowledge of legal, ethical, and efficacy issues regarding counseling services delivered via the Internet.

International Society for Technology in Education Standards. On the society’s website, International Society for Technology in Education (ISTE, 2015) defines itself as the premier nonprofit organization for educators and education leaders committed to empowering connected learners in a connected world. The organization represents 100,000 professionals. Although ISTE is aimed at PK-12 educational environments, educators in tertiary environments must stay abreast of the learning taking place in PK-12 in order to know how to best educate students when they get to college and graduate school. ISTE (2009) developed standards providing a roadmap for digital-age learning, promoting excellence and best practices educational technology. The ISTE Standards for Administrators are designed to enhance success of technology integrations into schools by focusing on skills needed by administrators to support and transform digital age learning. The ISTE Standards for Administrators include five broad
headings: (1) visionary leadership, (2) digital age learning culture, (3) excellence in professional practice, (4) systemic improvement, and (5) digital citizenship. The ISTE Standards for Teachers also includes five broad headings: (1) facilitate and inspire student learning and creativity; (2) design and develop digital age learning experiences and assessments; (3) model digital age work and learning; (4) promote and model digital citizenship and responsibility; and (5) engage in professional growth and leadership. The ITSE Standards for Students includes six categories (1) creativity and innovation, (2) communication and collaboration, (3) research and information fluency, (4) critical thinking, problem solving, and decision making, (5) digital citizenship and (6) technology operations and concepts. While students’ adherence to these specific standards is not required in CACREP-accredited counseling programs, the standards are certainly relevant in understanding students’ digital technology needs and expectations.

**Research evidence regarding digital technologies and technological competence in counselor education programs.** Because no studies to date have been published on teaching master’s-level counseling students about the use of MHMAs in therapeutic environments, the focus of this section of the literature review is counselor technological competencies and research on other types of digital technologies such as cybersupervision, distance counseling, video journaling, Second Life technologies, and social media in counselor education environments. This may provide insight into influencers of acceptance and use of emerging digital technologies such as MHMAs in counselor education.

In consideration of the drive toward counselor technological competency in ACA and APA ethical standards, CACREP standards, and the ACES guidelines, a few studies have evaluated the degree to which counselor education programs are producing technologically literate counselors. Studies conducted in the late 20th century and first few years of the 21st
century were likely considered in the development of the ACA (2014) Code of Ethics, CACREP (2009) accreditation standards, and the ACES (2007) technological competency standards. This focus of this literature review, however, will be on studies from 2000 forward as an indicator of technological competency in counselor education. Very few articles have been published in scholarly journals in the last decade on the topic of technological competence in counselor education programs. For that reason, much of the research discussed in this section comes from dissertations.

For a University of North Texas dissertation, Bullock (2003) surveyed 171 counseling students at a southwestern university regarding competence in word processing, spreadsheets, database programs, Internet use for communication and research, and technology-related ethical and legal issues. Bullock found no significant difference between competency scores and educational status (i.e., undergraduate, masters, or doctorate); no significant difference between technology skill and chronological age; and, no significant difference between counseling-track students and the general population of students enrolled in the university. Using a score standard of 80%, Bullock found only 11.1% of the students to be technically competent. While Bullock recommended that counseling programs implement specific courses on technology and counseling, infusing technology into established coursework was promoted by Bullock as the ideal approach to developing technologically competent counselors.

Waterman (2004) applied the technology acceptance model (TAM) by Davis (1989) to study technology utilization by doctoral-level counseling supervisors. Twenty-five CACREP-accredited counseling programs were randomly selected for participation. Completed were 225 surveys by doctoral student supervisors. This study indicated that doctoral-level counselors were using the ACES (1999) competencies to a moderate degree. E-mail was the most frequently used
competency. The competencies used less frequently were testing, diagnostic assessment, and distance counseling. Waterman’s study also indicated counselor reluctance to participate in cybercounseling because of ethical concerns. In addition, Waterman’s study aligned with previous technology acceptance studies indicating the robustness of the TAM for measuring acceptance of technology based on perceived usefulness and perceived ease of use. Waterman admits the findings of this study may not be generalized to master’s-level counseling programs or non-CACREP-accredited universities. Doctoral-level students, by participating in more years of education and research, are likely to have acquired greater technological competence than students who have not taken as many courses. In addition, this study was limited in that it used the ACES (1999) competencies; the ACES (2007) competencies are now in use.

In an article for Counselor Education & Supervision, Vaccaro and Lambie (2007) discuss computer-based supervision for counselors in training. The technologies used in supervision are email, teleconferencing, electronic mailing lists, chat rooms, and computer-assisted live supervision. The authors state, “The full potential of computer-based counselor-in-training supervision has yet to be realized in counselor education programs” (Vaccaro & Lambie, 2007, p. 2). They underscore the need to attend simultaneously to the best interests of the client and the supervisee, and to attend to ethical practice. Vaccaro and Lambie advocate for using this supervision method in addition to face-to-face supervision and for counselor education programs to establish their own standards. In addition, they stress the need to train both supervisors and supervisees in computer-based supervision methods, as both groups need to be technically proficient in order to ensure success of this supervision method.

Chapman, Baker, Nassar-McMillan, and Gerler (2011) extended the research on computer-based supervision and used cybersupervision, a term previously coined by Watson,
(2003 as cited in Chapman, Baker, Nassar-McMillan, & Gerler, 2011) to refer to this supervision modality. These researchers studied five master’s-level supervisees in one CACREP-accredited program in the southeastern United States over a 14-week counseling practicum course. The supervisor was a 41-year-old male advanced doctoral student. Cybersupervision consisted of a combination of synchronous and asynchronous methods including discussion threads, email, VHS video, and text chat. Supervisees shared and discussed significant practicum experiences; discussed counseling theories, ethics, and testing; and shared case stories. The supervisor rated counseling competence on a weekly basis for each student. They each demonstrated significant competency increases over the 14 weeks. Personally, the supervisees indicated increases in counseling confidence over the course of the semester. Overall, findings indicated the supervisor and supervisees were able to successfully communicate through synchronous and asynchronous cybersupervision.

Orr (2011) replicated Waterman’s (2004) study, with a different population: eighty-three master’s-level counselor trainees in one counselor education program at a northeastern United States university. Orr’s findings indicated moderate to high frequency of use of the ACES (1999, 2007) competencies and a positive relationship between perceived usefulness and frequency of use. A limitation of Orr’s study was that data were collected from one university. Based on this study, a moderate to high frequency of the ACES competencies is not generalizable to all CACREP-accredited graduate counselor education programs.

Wehrman (2004) studied Internet counseling for his University of South Dakota PhD dissertation. Surveys were solicited from counselor education program liaisons with a PhD or EdD from the 178 CACREP-accredited programs; 87 participated. Sixty-eight percent reported neither teaching nor utilizing chat-based counseling; 72% reported neither teaching nor using
video-based counseling. Of the respondents who were teaching or using Internet counseling, they were doing so in the ethics courses over other types of courses and in didactic courses over clinical courses at a 4:1 ratio.

In a master’s thesis for the University of Nebraska Omaha, Wilkins (2012) studied the relationship between licensed professionals’ attitudes toward online counseling and self-efficacy. Survey data were collected from 59 practicing counselors. A significant finding was that counselors with positive attitudes toward online counseling also had high self-efficacy with online tools, and those with negative attitudes toward online counseling had low self-efficacy with online tools.

Like Wilkins (2012), Flores (2012) also studied online counseling. Flores’ participants were counselor educators as opposed to the counseling practitioners in Wilkins’ study. Flores evaluated preparation of counselors for online counseling in a mixed methods study. In the quantitative strand, 64 counselor educators from CACREP-accredited programs were surveyed. Four participants were selected from the quantitative strand for interviews in the qualitative strand. Flores examined faculty values and level of discomfort regarding online counseling, the relationship between the number of years as a counselor educator and the value of online counseling, the relationship between counselor educators’ employed at universities offering Internet-based learning and values toward online counseling, and the relationship between counselor educators’ age and their attitudes toward online counseling. Multiple regression analysis and t-tests were used to analyze data. Flores found no statistical difference between discomfort with online counseling and the value of online counseling. The data indicated that counselor educators with a higher value of online counseling have lower discomfort with online counseling. No statistically significant difference was found between age and number of years as
a counselor educator and the perceived value of online counseling. In addition, whether or not a counselor educator worked at a university that uses the Internet for learning did not impact the value of online counseling. The qualitative themes in Flores’ study indicated all four counselors believed online counseling has its place, but should be used as an occasional tool when face-to-face counseling is not possible. A second theme was the need for educators themselves to be competent in online counseling in order to best teach students this method, along with the need for counselor education programs to train students in distance counseling. A third theme was the differences between face-to-face counseling and distance counseling and the need for a distance counseling framework. A fourth theme was confidentiality and privacy concerns.

Social workers receive educational training similar to that of counselors. Ahmedani, Harold, Fitton, and Gibson (2011) qualitatively assessed 128 youth, aged 13-14, to understand their relationship with information technology (IT) in order to inform social work education. This study indicated that youth of the twenty-first century not only exist in a technological world, but their lives are digital:

IT is infused into the psychological and moral choices of youth that impact their behaviors, including decision-making processes, adherence to parental rules, and establishment of personal boundaries. It is apparent that IT is firmly established in every aspect of these students’ lives. (Ahmedani et al., 2011, p. 9)

The majority of students reported the computer and its related functions to be the most favored, most used technology. Most found computers to be useful for communication, information, creation, and innovation. Findings from this study also indicated today’s students are “confident and competent in their technology use” (Ahmedani et al., 2011, p. 11). These future social work (and counseling) students will be heavy users of technology and will benefit from and even
expect IT use in their professional education. The authors concluded, “It is imperative that social work education is ready for the next generation” (Ahmedani et al., 2011, p. 14). This is similar to Prensky’s (2001) notion that learners are not the same as they have always been and that many of the instructional methods of the past are no longer relevant. In order to attract up-and-coming students, Ahmedani et al. (2011) stated IT must be included in social work curriculum.

Dickey (2011) investigated the potential risks and benefits of emerging technologies in professional psychology. Participants were 102 professional members and 29 student members of the APA. Participants viewed four scenarios of a fictitious psychologist using technology in practice. They then responded to an open-ended questionnaire. Correlational statistics and ANOVA were used to analyze quantitative data and a coding system was used to analyze responses to the open-ended questions. Dickey’s findings indicated that APA members viewed cost savings and increased accessibility to psychological services to be the major benefits of digital technology. Noting “ethical challenges emerge where technology moves faster than ethics boards” (Dickey, 2011, p. 3), Dickey found that psychologists regarded confidentiality-related ethical issues and boundary concerns to be the major risks with technology in the psychology field. Dickey also found participants were more likely to consider using mobile phone technology than Second Life technology. Implied from Dickey’s study is the need for more practical as well as ethical training in counseling related technologies in counselor education programs.

Video journaling as a means of reflective practice during internship was qualitatively studied by Parikh, Janson, and Singleton (2012). During a 15-week internship experience, seven internship students created two reflective video journals regarding their experiences with working with economically disadvantaged students in urban schools. The videos were 10
minutes in length and were discussed during individual supervision; some students also volunteered their video reflections for group supervision meetings. Four themes were identified: (1) a developmental process in learning to create a video journal; (2) greater authenticity in reflection as compared with written journals; (3) the parallel process of recording and reviewing reflections aiding awareness of the significance of reflection and clarity in communication with students; and, (4) apprehension about the process of video journaling. The latter concern abated for the students over time; in the end, participants reported a preference for video journaling over written reflective journaling. The results indicated video journaling contributed to growth in counseling development.

Tillman, Dinsmore, Chasek, and Hof (2013) investigated how social media may enhance counselor education in terms of recruitment, curriculum, and connections. These researchers indicate deficiencies in counselor education with the statement, “the digital age marches on with or without counselor education programs being prepared” (Tillman et al., 2013, p. 1). They note that even the ACA uses Twitter, blogs, podcasts, an online library, and an online learning web site to support professional development of counselors. The authors provide guidance for using social media in curricula and pedagogy and include a suggested policy for the use of social media in counselor education programs.

**Influence of generational differences on development of technological competency in counselor education.** A possible reason counselor education programs are not as proficient in instilling technological competency in students is a technology gap. Chandras (2000) indicates that older educators are more likely to be hesitant to incorporate technology in the classroom as they may be more stressed by IT. Quinn (2001) emphasizes that for several years, “students have arrived on campuses with computer skills that outdistance many instructors” (p. 3). Prensky
(2001) labels people who did not grow up with technology *digital immigrants*. Prensky (2001) proposes that although digital immigrants are certainly capable of learning, “their foot is in the past” (p. 2). Some examples are that digital immigrants tend to use the Internet for information after consulting other sources, tend to read program manuals rather than assuming a program will teach them to use the program, and tend to print documents for editing purposes. Prensky labeled the net or digital generation as *digital natives*: They are used to quickly receiving information, they like to multi-task; they prefer graphics before text; they thrive on instant gratification; and they prefer games to work. In pondering whether or not the digital immigrants should learn the new ways or if the natives should learn the old ways, Prensky (2001) states, “Unfortunately, no matter how much the immigrants may wish it, it is highly unlikely the digital natives will go backwards” (p. 3), and “if digital immigrant educators really want to reach digital natives . . . they will have to change” (p. 6). In order to succeed with teaching digital natives, Prensky admonished educators to reconsider both methodology and content.

*Professional counseling association conferences and education on emerging eHealth and mHealth technologies.* In examining counselor education and technological competence, another useful lens is continuing education and professional development sessions offered at professional conferences. East and Havard (2015) conducted a content analysis of 4,404 conference topics at 12 mental health-related association conferences for the years 2013-2015. With only 4.1% of the topics being technology-related and less than 1% of topics specifically addressing mental health mobile apps, an apparent need exists for more training regarding mental health technologies. This is no surprise considering studies such as Wehrman’s (2004). Recall that Wehrman’s research indicated, even when the relatively few counselor educators do teach or use the particular emerging technology of Internet counseling, they teach it in the ethics courses
over other types of courses, and they tend to teach Internet counseling in didactic courses over clinical courses. The counseling associations’ lag in training members regarding emerging technologies may be contributing to counselor educators’ hesitancy and even avoidance of training students in the use of beneficial technologies.

**Association conferences outside the counseling realm.** Looking beyond counseling associations to other organizations will aide counselor educators’ understanding of the impact of eHealth and mHealth, and the need for infusion of these technologies into counselor education. For example, it is clear from the list of research articles posted on the T2 (2015c) website the military is embracing eHealth and mHealth. The T2 staff has written journal articles and presented numerous conference topics on eHealth and mHealth. T2 (2015a) has also produced a variety of mental health apps.

Some associations are specifically devoted to health-related emerging technologies. According to The American Telemedicine Association (ATA, 2012) website, the association was established in 1993 to promote the use of advanced remote technologies. ATA aims to support professional, ethical, and equitable improvement in health care through education, collaboration, research, innovation promotion, and standards. The May 2014 conference in Boston, *Raising the Bar for Telemedicine Education*, had more than 6,000 attendees at what ATA’s website calls the world’s largest telemedicine show.

Medicine 2.0, according to the conference website, is the leading academic conference series for Internet, social media, and mobile apps in health. Experiencing much growth, Medicine 2.0 hosted two conferences in 2014, for its 7th annual world congress. One was in Malaga, Spain, and the other was in Maui, Hawaii. Medicine 2.0 is produced and organized by JMIR Publications, Inc. JMIR publishes the *Journal of Medical Internet Research* (JMIR).
According to the JMIR Publications (2015) website, JMIR was founded in 1998 and is a leading health informatics, health services, and health policy journal focusing on eHealth and mHealth technologies.

**Summary of counselor education and how it relates to this topic.** Research published since 2000 is minimal on topics of counseling-related technologies and technological competence in counselor education. No studies were located on the topic of counselor education regarding one of the most recently emerging mobile technologies, MHMAs. The studies located do, however, offer useful information for approaching a study on the topic of counselor education regarding MHMAs. The cited studies conflict on the degree of technological competence instilled through counselor education, yet this situation is understandable because the studies were conducted with different populations. Across the literature, the need is evident to improve technological competency in counselor education by including hands-on training as well as by including instruction regarding technology-related ethical issues.

Through this literature review, the importance of infusing existing and emerging technologies within and across all aspects of counselor education was revealed. It will be important in the near future to study the impact of the 2016 CACREP standards because of the increased focus on technology in counselor education and the technological competency assessment requirements, especially relevant in this burgeoning digital age of eHealth and mHealth. A quote by Wehrman (2004) well captures the need for improved efforts to enhance technological competency in counselor education:

Due to this technology-infused counseling paradigm shift and the overwhelming increase in online services, counselor educators have an obligation to promote instructional and
training practices that are consistent with research and current practice to ensure students keep abreast of current trends and best practice approaches. (p. 78)

With such global and national focus on eHealth and mHealth, counselor educators must stay current and infuse these technologies into counselor education programs so that future counselors will be prepared to practice in this technology-infused world. One specific type of mHealth technology, MHMAs, is the focus of this study. Attention turns now to research regarding MHMAs.

**Mental Health Mobile Apps**

MHMAs, covered under the broad heading of mobile health (mHealth), are applications (apps) for mobile phones designed to assess, enhance, or improve mental health or behavioral health. mHealth is encompassed within the broad heading of electronic health (eHealth). MHMAs are downloaded from app stores such as App Catalog for webOS, Apple App Store for iOS, BlackBerry World for BlackBerry OS, Google Play for Android, Nokia Store for multiple operating systems, Samsung Apps for Android and Samsung operating systems, and Windows Phone Store for Windows Phone operating system (BinDhim, McGeechan, & Trevena, 2014).

**Global use and initiatives.** The global mobile technology setting is critical to understanding MHMAs. In a report about a 2009 mHealth survey of 114 member states, the World Health Organization (WHO, 2011) cited various sources indicating five billion wireless subscribers worldwide. Seventy percent (3.5 billion) of subscribers reside in low- and middle-income countries.

It appears health consumers are interested in using mobile phone health services (Loo, 2009; Ricciardi, Mostashari, Murphy, Daniel, & Siminerio, 2013.) Br (2012), in an article for Medscape, an online source of medical information and educational tools for healthcare.
professionals, indicated smartphone users are “inundated with all types of downloadable applications (apps), including a myriad of so-called mental health self-help apps” (para. 1). Brauser cited data from ABI research indicating 9 billion downloaded apps in 2010 and an International Data Corporation forecast of 76.9 billion global downloads by 2014. Frost & Sullivan, a growth strategy company, noted 17,000 health related phone apps in 2011, according to a 2012 web article in M2 Presswire (“Mobile Applications,” 2012). Donker et al. (2013) cited a mobihealthnews report indicating 13,600 health apps in Apple’s App store alone in 2012; 24% (3,264) addressed mental health-related topics. The Mobile Healthcare Market Bible: 2014-2020 estimated the mHealth market will account for nearly $9 billion in 2014, and further growth in the next six years (“MHealth,” 2013). Further, a mobile medical app webpage on the Food and Drug Administration (FDA, 2014) website provides a link to statistics by research2guidance, mobile research specialists, estimating that by 2018, 50% of the more than 3.4 billion smartphone and tablet users will have downloaded mobile health applications.

The Office of the National Coordinator for Health Information Technology in the United States Department of Health and Human Services is driving a major paradigm shift to patient-centered care through the expansion of eHealth. This initiative aims “to promote advances in consumer e-health to increase patient engagement, improve individual health, and achieve broader health care system improvements” (Ricciardi et al., 2013, p. 376). The authors indicate that eHealth is far from realized and that conditions are ideal for fostering growth.

**General benefits and advantages of mobile phones for delivery of mental health education and interventions.** Several authors indicated that mobile phones are a useful and cost-effective tool for delivering large scale behavioral health interventions (Cohn, Hunter-Reel, Hagman, & Mitchell, 2011; Derbyshire & Dancey, 2013; Gasser et al., 2006; Kazdin & Rabbitt,
“Mobile Applications,” 2012; Ricciardi et al., 2013). Others emphasized the potential of the two-way audio-visual capabilities of smartphones for delivery of health interventions (Luxton, Mishkind, Crampton, Ayers, & Mysliwiec, 2012). Mobile phones provide the means for health and mental health providers to maximize patient outreach while minimizing cost; these phones offer a means to improve healthcare cost-efficiency (“MHealth,” 2013).

The WHO (2011) stated, mobile technologies have the “potential to transform the face of health service delivery across the globe” (p. 1). Similarly, Miller (2012) stated, smartphones have the ability to “transform psychology even more profoundly than PCs and brain imaging did” (p. 221). Further, Miller (2012) calls smartphones “ubiquitous, unobtrusive, intimate, sensor-rich, computationally powerful, and remotely accessible” (p. 221). Morris and Aguilera (2012) concurred: “Advances in mobile technology, constrained clinical care, and consumer demand for contextualized, non-stigmatizing, and low-cost alternatives are beginning to change the face of psychological assessment and interventions” (p. 1). WHO’s mHealth report indicated applications of mobile phone technologies in maternal and child health, diseases, access to emergency and general health services, and enhancing treatment. The WHO (2011) report also noted that the United Nations included mHealth as a key innovation for advancing the Global Strategy for Women’s and Children’s Health which was launched in New York in 2010.

Mobile phones offer advantages over the Internet in that the former is assimilated into users’ daily lives, a fact which may increase awareness of the intervention. Mobile applications also tend to be more user-friendly and condensed than non-mobile computer applications. The nature of recent smartphones with two-way audio and video features permit synchronous and real-time communication, a feature which is useful in delivery of healthcare delivery. (Donker et
al., 2013; Luxton et al., 2011; Miller, 2012). In addition to using mobile phones to deliver treatment inventions, psychoeducation, audio recording of sessions, and virtual coaching, Luxton et al. (2011) highlighted being able to connect external hardware devices such as biofeedback sensors to mobile phones. This capability may be useful in treatment and research. Miller (2012) further explains:

If participants download the right *psych apps*, smartphones can record where they are, what they are doing, what they can see and hear, and can run interactive surveys, tests, and experiments through touch screens and wireless connections to nearby screens, headsets, biosensors, and other peripherals. (p. 221)

It is also beneficial to look at MHMAs through the eyes of mental health practitioners. To gain background for developing a schizophrenia app, Ben-Zeev et al. (2013) met with a group of eight practitioners recruited to represent a wide range of specializations. They first completed a brief survey regarding the potential use of mobile devices for services for their clients. Then they engaged in a focus group type discussion led by two of the authors. All practitioners believed their clients could learn to use a mobile device. The majority believed clients would respond to multiple treatment prompts per day. In subsequent discussion sessions, practitioners indicated they saw benefits of effective mHealth tools, especially for people who are difficult to reach.

**Challenges, cautions, and limitations of MHMAs.** The use of mobile phones for mental health interventions and research presents a variety of challenges, cautions, and limitations. Some issues of mHealth mobile apps are consumer engagement, reservations of healthcare providers to recommend apps, and lack of quality research, (“Mobile Applications,” 2012). Usability, standards, safety, data security, privacy, and limited scientific evidence will also be discussed.
**Usability and acceptance.** Luxton et al. (2011) highlighted the importance of considering usability and acceptance by end-users by studying published findings. Recognizing individual preferences and affordability was indicated to be a priority in considering MHMAs.

**Oversight and standards for MHMAs.** Many apps have been designed by software developers, not mental health professionals. Many apps have been released without scientific testing. As Kiume (2013) stated in an online *Psych Central* blog with information on reputable apps, MHMAs “range from beneficial, to harmless but useless, to bordering on fraudulent” (n.p.). Luxton et al. (2011) also addressed quality control and lack of oversight or standards for MHMAs.

However, oversight and standards are gradually arriving on the mHealth scene. Based on a 2009 global survey, WHO implemented a strategic approach to planning, development, and evaluation of eHealth. The vehicle is mHealth. WHO (2011) is supporting the use of mHealth to maximize impact, provide information on best practices, develop mHealth related databases, provide guidance on data privacy and security, and establish country-based strategies and policies to maximize mHealth potential.

In addition, the FDA (2015) encourages the development of mobile medical apps and issued Mobile Medical Applications Guidance for Industry and Food and Drug Administration Staff. This guide explains the FDA’s oversight of mobile apps as devices. Also addressed by the guide is the FDA’s intention to use a risk-based approach to assure safety and effectiveness of mobile apps that meet regulatory definitions of *device*. The agency’s efforts to focus on devices that pose a greater risk to patients is also covered by the guide.

Partnering with the FDA on eHealth policies and regulations is the Office of the National Coordinator for Health Information Technology. This agency aims to increase patients’ access to
their health information, to empower consumers to take action with that information, and to shift the paradigm to patients and providers’ acting as partners in health care. The National Coordinator has issued periodic challenges to reward innovators who develop solutions to specific health information technology. In addition, the National Coordinator has worked with the Federal Trade Commission to implement a web-based Model Privacy Notice for personal electronic health records for companies to use in describing their practices (Ricciardi et al., 2013).

**Client safety.** People in need of mental health treatment may be experiencing impaired thinking or intense emotions that may interfere with learning a complex mobile tool. It is therefore important to simplify the interaction (Boschen & Casey, 2008). Along these lines, Luxton et al. (2011) stressed the need to consider patient safety, as dropped calls and battery failures may place high-risk patients who rely on these technologies in jeopardy if the technology fails.

**Data security and privacy.** Bennett, Bennett, and Griffiths (2010) indicated the importance of security concerns for success of eHealth projects and especially for success of e-mental health interventions. These authors defined three main security areas: methodological, technical, and procedural. Unauthorized access or physical loss of a mobile device may threaten data security and privacy. Users should be cautioned to use device password-protection features. Patient confidentiality is also an issue because some apps send user information back to software developers and third-party companies. Mental health professionals who recommend apps need to be aware of information being collected by apps and how the information will be used. These issues need to be addressed in informed consent procedures (Luxton et al., 2011). Luxton et al. (2011) also clarify the boundaries of the Health Insurance Portability and Accountability Act.
While HIPPA does not apply to end-users storing and sharing data between other end users on a mobile device, “if the user transmits or shares protected health information with a health care provider . . . the provider must ensure HIPPA compliance” (Luxton et al., 2011, p. 510). In addition, mental health interventions for mobile phones may be impaired by device-related problems such as battery or hardware failures. Maintaining connections to the Internet, network, or particular site may also cause difficulties (Donker et al., 2013).

**Limited scientific evidence.** Considering that the first apps became available for download in 2008 (Donker et al., 2013; Luxton et al., 2011) and considering the time it takes to move through the process of design and development to conducting trials to publication, research is limited. According to Kumar et al. (2013) “randomized control trials (RCTs), the gold standard for determining the efficacy of health interventions, have a long time lag (i.e., 5.5 years on average) for the initiation of subject recruitment to publication of the outcome” (p. 230).

Seeking RCT evidence on MHMAs, Donker et al. (2013) conducted a systematic review of literature spanning 2008 to 2013. These researchers noted that, although thousands of MHMAs were available through Android, Apple, and Microsoft, the majority failed to incorporate quantitative analyses, and most lacked scientific efficacy evidence.

Donker et al. (2013) examined 5,464 abstracts and identified only eight trials that met inclusion criteria for evidence-based mental health apps that could be directly downloaded from an app store. These eight trials described five apps: Mobilyze! Mobiletype, DBT Coach, Mobile Stress Management, and Get Happy Program. The authors reviewed the sundry limitations of these eight trials and surmised “the quality of the studies varied but was generally low” (p. 6). Other noted research and related quality concerns were a high risk of bias in some studies, the
inability to determine if beneficial effects were the result of natural remission or other
confounds, and the inability to determine sustainability of results.

Overall, Donker et al. (2013) indicated the evidence-based apps did show promising
results for reducing depressive symptoms, stress, anxiety, and substance abuse. They also
indicated that when researchers assessed usability, helpfulness, and satisfaction ratings, the
MHMAs were perceived to be useful for self-monitoring and self-help. At the time of
publication of the Donker et al. article only two of the evidence-based apps were available for
public download. The authors advocated for more randomized control trial research in order to
reduce bias and determine efficacy of MHMAs. A review of literature by Plaza, Demarzo,
Herrera-Mercadal, and Garcia-Campayo (2013) on mindfulness-based mobile applications also
indicated a wide selection of apps, but very little evidence supporting usefulness of the apps and
no randomized control trials.

To help overcome the problem of limited research evidence, a panel of experts assembled
by the Agency for Healthcare Research and Quality and the National Institute of Mental Health
met several times in 2010 to review the state of health information technology in mental health
and to identify its top research priorities (Mohr, Burns, Schueller, Clark, & Klinkman, 2013).
The panel determined that videoconferencing in the delivery of psychotherapy (i.e., distance
counseling) has been well validated, web-based mental health interventions have shown efficacy,
and virtual reality has shown efficacy for anxiety and pediatric disorders. The panel also
determined that online support groups (a type of social media) have produced “disappointing
outcomes when used alone” (Mohr et al., 2013, p. 332) and that serious gaming has received
“little work in mental health” (Mohr et al., 2013, p. 332). Most relevant for this study on the
topic of counselor education regarding MHMAs, Mohr et al. determined that, as of 2010, mobile technologies had received limited attention for mental health outcomes.

Kumar et al. (2013) described the work of another group of experts who met in 2011 for the mHealth Evidence Workshop at the National Institutes of Health (NIH). These experts described a continuum for mHealth tools (Figure 1) and set goals for evidence generation in the field of mHealth (Kumar et al., 2013). This group offered several research design alternatives to the RCT approach since the time lag associated with RCT may often mean “the technology may be obsolete before the trial is completed” (Kumar et al., 2013, p. 230). Moreover, Kumar et al. proposed that the need for more timely research may actually stimulate innovation of more proficient research designs, such as Continuous Evaluation of Evolving Behavioral Intervention Technologies (CEEBIT) as described by Mohr et al. (2013). CEEBIT takes advantage of smartphone capabilities to “routinely and iteratively collect data in a planned and strategic manner and generate evidence through systematic prospective analyses, thereby creating a system that can learn” (Mohr et al., 2013, p. 517). Kumar et al. (2013) advocated for a “transdisciplinary scientific discipline” (p. 235) for approaching increased efforts in mHealth research.


**Recommendations for MHMAs developers and disseminators.** First and foremost MHMAs need to be credible and evidence-based (Derbyshire & Dancey, 2013). Gasser et al. (2006) based on their study of a mobile lifestyle coaching application, recommended interventions be matched to the actual motivation and preferences of individuals. Mishra (2011) recommended companies design user-friendly apps, offer external support, emphasize tangible benefits in order to minimize consumers’ effort expectancy, test apps across a variety of devices, and account for moderating roles of personality attributes and psycho-demographic characteristic of adopters and non-adopters. The Ben-Zeev et al. (2013) study also pointed to the need for devices and treatment tools to be easy to use. Paschou, Sakkapoulos, and Tsakalidis (2013)
suggested app designers recognize that development and design effort is often repeated, a costly and time-consuming process. They admonish developers not to reinvent the wheel, and they offer a solution for creating apps through a simple web user interface.

Shin, Shin, Choo, and Beom (2011) studied factors influencing intentions to use smartphones with a sample of students, faculty, and staff from 10 universities in South Korea. Based on their findings, these researchers recommended that developers strongly consider two factors in designing ubiquitous learning (uLearning) apps for mobile phones: consumer perceived usability and consumer perceived quality: “Focusing on user perceptions of smartphone quality is one key factor for achieving a market breakthrough” (p. 2212).

Based on findings from a study of PE Coach app for posttraumatic stress disorder, Kuhn et al. (2014) offered dissemination suggestions for apps that may be used in treatment by clinicians who may not own smartphones. They suggested the provision of basic training to expose clinicians to smartphones and apps. Like Mishra (2011), Kuhn et al. suggested that promotional materials need to highlight the relative advantage of apps while emphasizing ease of use for practitioners and for patients. In the creation of depression intervention technologies, White, Caine, Connelly, Selove, and Doub (2014) emphasized the need for designers to address practitioners’ technology concerns early in the design phase and to consult various types of health practitioners.

Burns, Montague, and Mohr (2013) offer a model for designing culturally informed behavioral intervention technologies. This systematic process is explained through the lens of the stages applied by the authors during the design of a behavioral intervention targeting generalized anxiety disorder and major depressive disorder in young sexual minority men (Figure 2). The National Institute of Mental Health funded the Burns et al. study. While aimed at the
development of behavioral intervention technologies, the authors noted the model is also applicable to developing interventions that do not involve technology.

**Figure 2.** Process for the initial design of a behavioral intervention technology. From “Initial design of culturally informed behavioral intervention technologies: Developing a mHealth intervention for young sexual minority men with generalized anxiety disorder and major depression,” M. N. Burns, E. Montague, & D. C. Mohr, 2013, *Journal of Medical Internet Research, 15*(12), p.2. Copyright 2013 by Michelle Nicole Burns, Enid Montague, and David C. Mohr. Open-access article created under the terms of the Creative Commons Attribution License.

**Research evidence regarding MHMAs for specific mental health issues.** A variety of health topics such as smoking cessation and weight loss have implications for improving mental health. Some MHMAs target changing particular behaviors in order to improve mental health, while other MHMAs directly target moods, anxiety, and depression. Numerous research studies
regarding web-based mental health interventions exist, but the focus of this study is on evidence regarding mobile phone applications, specifically MHMAs.

**Anxiety and stress.** Lappalainen et al. (2013) conducted an RCT regarding a mobile technology intervention, P4Well, for treatment of work-related stress in Finland. P4Well combined cost-efficiency of group meetings, self-monitoring, and between-group meeting mobile interventions to enhance treatment impact. The treatment was based on cognitive behavioral therapy (CBT) and acceptance and commitment therapy (ACT). The intervention included a web-based portal, a mobile phone with three pre-installed applications, a pedometer, and a heart rate monitor (Figure 3).

![Figure 3. P4Well intervention process. Adapted from “Feasibility of a personal health technology-based psychological intervention for men with stress and mood problems: Randomized controlled pilot trial,” by P. Lappalainen, K. Kaipainen, R. Lappalainen, H. Hoffrén, T. Myllymäki, M. L. Kinnunen, . . . I. Korhonen, 2013, Journal of Medical Internet Research, 2(1), p. 5. Copyright 2013 by P. Lappalainen, K. Kaipainen, R. Lappalainen, H. Hoffrén, T. Myllymäki, M. L. Kinnunen . . . I. Korhonen. Open-access article created under the terms of the Creative Commons Attribution License.](image-url)
Results of the Lappalainen et al. study confirmed the intervention was acceptable and actively used, it had a positive effect on depression and psychological symptoms, and was cost effective. The researchers indicated that the total professional time used during the active intervention time was less than one hour per person. Data from this study suggested the value of combining face-to-face human interactions with mobile interventions and self-management. P4Well is not available in the United States, and no direct follow-up studies or replications have been published; however, the researchers are working on several mobile applications that are a next step from P4Well (P. Lappalainen, personal communication, March 27, 2014).

Dennis and O’Toole (2014) examined effects of a gamified Attention-Bias Modification Training (ABMT) app in 78 trait-anxious participants: “ABMT is an emerging computer-based therapeutic approach rooted in neurocognitive models of anxiety that overcomes many obstacles to treatment . . . and is a prime candidate for development into mobile, gamified interventions” (p. 2). Participants were divided into two groups: either the ABMT group or a placebo training group. A variety of pre- and postmeasures were given to assess trait anxiety and depression. According to Dennis and O’Toole (2014), “Results showed that a single session of gamified ABMT effectively reduced threat bias, subjective anxiety, and observed stress reactivity” (p. 12). This study also indicated the potential of MHMAs for prevention, treatment, and self-help. The researchers highlighted the need for more efficacy studies regarding long-term use of MHMAs.

**Borderline personality disorder.** Rizvi, Dimeff, Skutch, Carroll, and Linehan (2011) conducted a pilot study of an interactive mobile phone application called DBT Coach. This app was created to assist people with borderline personality disorder (BPD) in applying a specific technique from dialectical behavior therapy (DBT). The study aimed to determine whether clients with BPD and substance use disorders (SUD) who were already receiving DBT would use
a DBT coaching mobile phone application and if using the app would be associated with a positive treatment outcome.

A variety of pre-existing measures along with study-specific instruments were used to establish a baseline. After the pretrial assessments, participants used the DBT Coach on Nokia smartphones for 10-14 days. All other phone features were disabled. The DBT Coach app recorded participants’ activity into a data file. This file consisted of responses to daily questionnaires regarding urges to use substances and helpfulness of the DBT Coach.

At the end of the trial, each participant completed outcome measures, and a satisfaction and usability survey. Therapists also completed a brief questionnaire about clients’ behaviors before and during the trial. The mean participation rate in daily assessment compliance was 85%. Results from the general usability and satisfaction scales indicated that the DBT Coach was perceived as usable, helpful (96.8% of the time), and easy to navigate.

Ratings of emotional intensity and urges to use substances were significantly higher at the beginning of the study than at the end of the study. There was a significant increase in therapists’ ratings of clients’ use of the DBT skill of opposite action (OA) at the end of the trial, yet no difference in therapists’ ratings of their client’s overall skills. In addition, participants demonstrated a significant increase in their ability to identify the different components of OA and their ability to appropriately use OA when needed. Finally, both measures of psychopathology, Beck Depression Inventory and Global Severity Index, indicated a significant decrease in scores over the course of the trial (Rizvi et al, 2011).

*Depression.* Burns et al. (2011) investigated Mobilyze!, a mobile phone and Internet intervention. Mobilyze! was developed by Northwestern University Center for Behavioral Intervention Technologies (CBITs). It maximizes the use of mobile phone sensors to detect user
states to improve treatment for depression. A screenshot of the intervention is found in Figure 4. Burns et al. investigated technical feasibility, functional reliability, and patient satisfaction and determined preliminary evidence of efficacy for depression intervention with Mobilyze! After using Mobilyze! for eight weeks, eight adults with major depressive disorder showed significant improvements on self-reports and interview measures of depression, were less likely to meet the criteria for the disorder, and showed a decrease in anxiety (Brauser, 2012). The Burns et al. (2011) study on Mobilyze! was identified by Donker et al. (2013) as one of the few evidence-based studies regarding MHMAs. According to D. Mohr (personal communication, January 20, 2015), CBITs Mobilyze! with its’ context sensing, is still under development. Mohr also said the app portion of Mobilyze! has been recreated and is being tested under the name ThinkFeelDo. CBITs is also testing mini apps through a program called IntelliCare and first versions are available on Google Play.

![Mobilyze! app screenshots](image-url)

*Figure 4. Mobilyze! app screenshots. From “Mobilyze – A Therapist in your Pocket,” [Abstract], by David C. Mohr, 2012, iMedicalApps.com, (http://www.imedicalapps.com/). Used with permission (Appendix J).*
Ly et al. (2014) conducted a randomized control trial in Sweden comparing two smartphone-delivered treatments, one based on behavioral activation and the other based on mindfulness. Forty patients diagnosed with major depressive disorder received a behavioral activation treatment, and 41 patients received the mindfulness smartphone treatment. The Beck Depression Inventory II (BDI-II) and the Patient Health Questionnaire Depression Scale (PHQ-9) were used for outcome measures. These instruments were administered pretreatment, post-treatment, and six months after treatment had ended. The PHQ-9 was also administered weekly during the entire treatment phase. Secondary outcome measures were the Beck Anxiety Inventory (BAI), the Quality of Life Inventory, and the Acceptance and Action Questionnaire.

The behavioral activation intervention included a maximum of 20 minutes per participant per week with a therapist and a short psychoeducational and step-by-step behavior program administered through a smartphone application that had been tested in a pilot study. The mindfulness group also received 20 minutes per week with a therapist and completed activities on the mindfulness app, which was commercially available.

According to Ly et al. (2014), both groups rated their treatment as credible on a credibility rating scale after one week of treatment. At the six month follow-up, 88.2% from the behavioral activation group no longer met the criteria for depression, and 81.3% in the mindfulness group no longer met the criteria for depression. The two interventions did not differ significantly from each other, and there were no significant differences in recovery rates between the two groups at post-treatment or six months later. Results also demonstrated that behavioral activation may be more suited for a more severely depressed population and mindfulness intervention may be more suited for people with mild depression.
Another randomized control trial on a mobile phone intervention for depression was conducted from 2009 to 2011 in Australia by Kauer et al. (2012). The researchers used version four of a piloted mobile-type program, Mobile Tracking of Young People’s Experiences, developed by Murdoch Children’s Research Institute. Participants ($N = 118$) were lent a mobile phone with an installed intervention or a comparison program. Various measures to assess depression, anxiety, and stress were given as a pretest, a posttest, and as a six-week follow-up. The study indicated that self-monitoring mood, stress, and coping strategies increased awareness of emotions and that increases in emotional awareness decreased depressive symptoms in adolescents. The authors indicated the suitability of mobile phones for self-monitoring for improving mental health. They also indicated mobile phones are a viable means for patients to collect data to share with health practitioners. When patients provide accurate information collected in real time about their moods and stress, practitioners may use this information to better determine treatment interventions.

**Dating violence and domestic violence.** Lindsay et al. (2013) conducted a qualitative study on the prototype of a dating violence app designed to assist young women in assessing danger in abusive relationships and in developing a safety plan. The authors highlighted the relevance of the app for Millenials as heavy technology users and early adopters of technologies. The researchers also pinpointed the appropriateness of the app for the developmental stage of the intended age group. The app incorporated research on usefulness of decision aids and empowerment models. User responses to relationship, safety, and priority assessments generated customized safety plans based on mathematical algorithms.

Thirty-eight female college students in four states reviewed the app for usefulness, understandability, appropriateness, and comprehensiveness and then participated either in focus
groups or individual semistructured interviews. Transcripts were uploaded into Dedoose qualitative software, and then, content analysis with open coding was used to identify themes and patterns. Safety concerns regarding abusive partners’ becoming aware of app use was the most common theme; participants suggested the app have an unrelated name and icon and be pin protected with no option to change the pin. Participants also suggested users be provided with information about how to delete the app should they feel their safety was being compromised by the app. Participants generally agreed the app “was a useful, innovative, and effective way to get information to students about dating violence and safety in relationships” (Lindsay et al., 2013, p. 13).

The Lindsay et al. (2013) research study was sponsored by the One Love Foundation. Two related apps were developed by the One Love Foundation; both are available for free downloads on iOS and Android devices. The One Love MyPlan app (Figure 5) is designed to help college students evaluate relationships for healthiness and safety. The One Love Lite danger assessment app is designed to be used in conjunction with professional consultation. It features a live chat function with 24-hour support through the National Domestic Violence Hotline.

Mental health apps for military families. T2 has published 75 papers between 2008 and early 2011 (Comstock, 2013) and more since then according to the T2 website. This agency has developed several MHMAs under the direction of T2 psychologists to help military families deal with mental health issues and traumatic brain injury. Aiming to meet the needs of highly mobile service members (Bush, Ciulla, Gahm, Miskind, & Reger, 2011; Bush, Fullerton, Crumpton, Metzger-Abamukong, & Fantelli, 2012), at least 27 military MHMAs are planned, in development, or already publicly available (Bush et al., 2012). A few of the T2 apps, BioZen, LifeArmor, PE Coach, PTSD Coach, and Virtual Hope Box, are discussed in this section.

BioZen (Figure 6) was developed by T2 to help military service members use biofeedback for relaxation. This free Android app requires the purchase of a compatible medical sensor (price range $75 to $150). Real-time data is collected from multiple body sensors (electroencephalogram, electromyography, galvanic skin response, electrocardiogram, respiratory rate, and skin temperature) and sent to users’ phones so users may see how their bodies are responding to their behaviors. Users view their brain wave activity to understand their meditative and attentive cognitive states (T2, 2015a). In an online article for mobihealthnews.com, Comstock (2013) interviewed David Cooper, a T2 psychologist. Because BioZen works with a Bluetooth interface, Cooper indicated that an iOS version of BioZen is not likely. Cooper also said efficacy studies on BioZen are planned, noting that T2 releases apps based on research-driven practices.
According to a T2 press release, LifeArmor (Figure 7) was designed to help with post-deployment issues. The app includes psychoeducation, assessments, videos, and self-management guidance on behavioral topics: alcohol and drugs, anger, anxiety, depression, families and friendships, families with children, life stress, mild traumatic brain injury, military sexual trauma, physical injury, posttraumatic stress, resilience, sleep, spirituality, stigma, tobacco, and work adjustment (Jimenez, 2012). LifeArmor is available for iOS and Android (T2, 2015a). A study by Bush, Skopp, Smolenski, Crumpton, and Fairall (2013) is based on an earlier version of LifeArmor (J. E. Osenbach, personal communication, March 24, 2014) called Mobile Screener. Bush et al. (2013) compared psychometric properties of seven behavioral health measures collected by three different modalities: pen and paper, computer, and iPhone. Forty-
five army soldiers participated in the study. Internal consistencies were found to be high across all modalities. In addition, test-retest reliability of the iPhone measures were found to be very high. Users reported the iPhone measures to be easy and convenient, and preferred the iPhone over the other modalities. Seventy-six percent indicated they would recommend the iPhone version to other service members (Bush et al., 2013). Researchers concluded that the study supported smartphones as a vehicle for behavioral health screening.


Another T2-developed app is PE Coach, the first mobile app to support the treatment of posttraumatic stress disorder (PTSD) treatment. PE Coach was released in 2012 for Android and Apple devices (Figure 8). According to Kuhn et al. (2014), as of October 2013, PE Coach had been downloaded over 16,000 times in 55 countries, and more than 1,500 Veterans Administration (VA) clinicians had been trained to deliver PE Coach. This app is to be used as a partnership between clinicians and patients in prolonged exposure (PE) therapy. The purpose is
to help service members confront the memory of traumatic experiences and to help them in day-to-day life as they deal with distressing material. Patients bring their smartphones to therapy and use the audio feature to record the PE therapy treatment. Clients complete the homework assignments on the app. Homework includes psychoeducation, audio-visual training on breathing retraining, in vivo exposure treatment, and weekly PTSD symptom checklists. At subsequent sessions, therapists review homework with clients. Clinicians can view the usage by date and time stamp capture to monitor treatment progress. A thorough explanation of PE Coach was published in *Psychological Services* by Reger et al. (2013).

![PE Coach app screenshots](http://t2health.dcoe.mil/apps/pe-coach)


Prior to releasing PE Coach, Kuhn et al. (2014) conducted a study of the app based on innovation diffusion theory (Rogers, 2003) and behavioral intentions (Ajzen, 1991). Kuhn et al. cited theirs as the first study to seek to understand clinician perspectives on integration of a
MHMA with therapy. VA mental health clinicians (N = 163) who treated PTSD a minimum of 50% of the time participated. Participants completed an initial web-based survey and then read a brief objective description of the app. Next, participants completed an objective 22-item questionnaire designed to measure perceptions of relative advantage, compatibility, complexity, future use intentions, and endorsement. Participants’ perceptions of PE Coach were favorable but not very strong for using a smartphone app as an adjunct to therapy for PTSD. Participants did not perceive the app as being too complex for use. In regard to generational influence, clinicians younger than 40 years old, who owned a smartphone, and who had used an app in treatment held more favorable perceptions than clinicians older than 40 who did not own a smartphone, and who had not used an app in treatment. Significant predictors of intentions to use the app were owning a smartphone and having favorable perceptions of PE Coach (Kuhn et al., 2014).

The Veteran’s Association National Center for PTSD and T2 jointly developed another PTSD free mobile app, PTSD Coach (Figure 9). This app uses cognitive behavior therapy (CBT) principles to support self-management of PTSD. T2 reported the app had been downloaded 45,000 times in 58 countries, with high consumer satisfaction. Users reported PTSD Coach helped them identify ways to manage symptoms, problem solve, and enhance knowledge of PTSD. The app may be integrated with therapy or used as a stand-alone tool. This app received the American Telemedicine Association 2012 President’s Award for Innovation (T2, 2015b).

According to the T2 website, a research study with Veterans with PTSD indicated that 88% were moderately to extremely satisfied with the app and that more than 75% felt the PTSD Coach helped them find ways to manage symptoms, understand symptoms, and find solutions.
Virtual Hope Box (Figure 10) was designed by T2 to reduce suicidal ideation. Bush et al. (2012) highlighted the development of Virtual Hope Box in a downloadable brochure on the T2 website. The authors indicated that since 2001, more than 1.5 million United States military services members have been deployed in support of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Many of these soldiers have experienced traumatic brain injury and mental health problems including PTSD, depression, anxiety, stress, and family and social dysfunction. Some soldiers committed suicide. Bush et al. (2012) cited the 2010 Department of Defense (DOD) Suicide Event Report which indicated 281 confirmed suicide completions and 863 attempts by 837 individuals.

Virtual Hope Box, grounded in cognitive therapy and dialectical behavior therapy, treatments with demonstrated usefulness for treating suicidality, challenges users to redirect
attention to reasons for living and to modify thoughts and behaviors to lead to desired outcomes, by using links to favorite music, family photographs, reminders of accomplishments and aspirations, supportive messages from family and friends, and a variety of games and puzzles. These distractions help divert thoughts away from suicide ideation.


Development of Virtual Hope Box included several phases of usability testing, field testing, semistructured interviews, clinician focus groups, and electronic usage logs. The Thoughts, Feelings, and Behaviors Questionnaire was administered pre- and post-intervention.
According to the T2 website, an article about Virtual Hope Box was recently published in *Suicide and Life-Threatening Behavior* (Bush et al., 2014).

**Pain management.** Kristjánsdóttir et al. (2013) studied a smartphone intervention to reduce catastrophizing and increase functioning in women in Norway with chronic pain. This four-week intervention followed treatment in an inpatient chronic pain rehabilitation program and was based on Acceptance and Commitment Therapy (ACT) a form of Cognitive Behavior Therapy (CBT). Participants (*N* = 140) were randomly divided into a treatment group and a control group. The treatment group received one face-to-face session and four weeks of written communication through a smartphone. When participants registered pain-related thoughts and feelings, they received personal feedback from a therapist designed to reduce catastrophizing and to increase functioning. Audio files with mindfulness exercises were also available in the smartphone intervention. The control group received access to a non-interactive website with self-help pain management information but did not receive the smartphone intervention. A variety of instruments were used to determine that the intervention reduced catastrophizing and increased functioning. Positive effects persisted at a five-month follow-up.

**Schizophrenia.** For an article in the *Psychiatric Rehabilitation Journal*, Ben-Zeev et al. (2013) outlined the development and usability testing of an MHMA for self-management of schizophrenia, which was ultimately named FOCUS by the study participants. Nine hundred and four individuals with schizophrenia and schizoaffective disorder receiving care at a large psychiatric rehabilitation agency in Chicago completed a survey on current mobile device use and mHealth interest. Sixty-three percent reported owning a mobile device, and many also indicated mHealth interest.
A multidisciplinary team worked together and produced FOCUS, which is classified as a mHealth intervention. This smartphone system developed by Ben-Zeev et al. (2013) targeted “medication adherence, mood regulation, sleep, social functioning, and coping with symptoms" (p. 1). The system was modified as design vulnerabilities became evident. The application was designed to be installed on a phone, rather than a web-based application that would require Internet connectivity. The theoretical foundation for FOCUS is “the cognitive model of psychosis and the stress-vulnerability model of schizophrenia” (Ben-Zeev et al., 2013, p. 4). The practitioners who developed the app aimed to target maladaptive thinking styles, improve social interaction, encourage healthier interpretation of hallucinatory symptoms, and offer stress reduction techniques to decrease vulnerability to relapse. Five general domains were addressed in FOCUS: medication adherence, mood regulation, sleep, social functioning, and coping with hallucinations. Particular attention was given to designing a user-friendly app, such as limiting distractions on the screen, creating a simple design, minimizing the need for abstract thinking, requiring only a low reading level, including only a minimal amount of text, including interwoven visual displays, and providing simple navigation.

Laboratory usability sessions were conducted with 12 individuals with schizophrenia or schizoaffective disorders. All participants were able to learn to use the device and the FOCUS app. Modifications to FOCUS were implemented based on participants’ comments and reactions. All 12 indicated that they would be able to use the system and the majority viewed the app as easy to use and helpful. The research design employed by Ben-Zeev et al. (2013) pinpointed the importance of gathering input from end users during the development process.

**Smoking cessation apps.** BinDhim, McGeechan, and Trevena (2014) conducted a feasibility study across three countries (Australia, the United Kingdom, and the United States) to
determine who uses smoking cessation apps. In 2012, these researchers used a cross-sectional study of adults to determine who downloaded Quit Advisor through the Apple and Android app stores. Of the 1,751 Quit Advisor downloads that year, 47% were from the United States, 29% were from the United Kingdom, and 16% were from Australia. Questionnaires built within the Quit Advisor app were completed by 602 participants: 58% were female, and the mean age was 32 years. Significant differences between countries were found in terms of gender and state of change. The majority had never sought professional help for smoking cessation, and 77% were ready to quit smoking within the next 30 days. The researchers concluded that the Quit Advisor app was able to reach smokers across three countries and that respondents were relatively young, and almost demographically similar. Another finding was that the users of Quit Advisor frequently used other health-related apps, mostly without checking the publishers’ credibility.

Choi, Noh, and Park (2014) conducted a study on mobile phone smoking cessation apps available in South Korea through the lens of self-determination theory (SDT). They evaluated the extent to which smoking apps satisfy basic needs identified by SDT (autonomy, competence, and relatedness), which have been shown to stimulate autonomous motivation. These three needs are related to behavior change, and for this reason, the researchers proposed that apps lacking even one of these three components may be limited in inciting continuous behavior change. The researchers randomly selected 175 out of 309 smoking cessation apps identified in the iTunes store and Google Play, developed a coding scheme, and established intercoder reliability. Only 10% of the apps addressed all three basic needs, and the majority of the apps tended to present extrinsic goal content (i.e., money) over intrinsic goal content (i.e., health). Choi et al. concluded that some of the apps have features that satisfy basic needs and, as such, may be useful in promoting smoking cessation.
**Substance abuse apps.** Bernhardt et al. (2009) demonstrated the validity of wireless mobile devices as a daily assessment of alcohol use among college students in a study sponsored by the National Institute on Alcohol Abuse and Alcoholism and Centers for Disease Control and Prevention. The researchers used a two-group randomized design. The Handheld Assistant Network Diary (HAND) captured “similar levels of total drinks, drinking days, and drinks per drinking day as the paper-and-pencil diary” (Bernhardt et al., 2009, p. 771). HAND has not been developed into a mobile app (J. M. Bernhardt, personal communication, March 27, 2014).

Cohn et al. (2011) conducted an inventory as a needs assessment to determine the number of MHMAs for promoting change in alcohol use behavior. The researchers identified MHMAs utilizing principles of daily self-monitoring of alcohol use. Of more than 700 apps related to alcohol behavior, nearly 75% focused on alcohol consumption (drinking games or entertainment). Cohn et al. found that few apps addressed alcohol use behavior change intervention or recovery. They located no efficacy studies on any of the apps that did promote behavior change and acknowledged the window for growth in efficacy research. They also provided a variety of recommendations for designers to include in the development of future alcohol cessation apps.

Crooke et al. (2013) used mobile phones to assess temporal mood changes associated with adolescent drinking. Forty-one secondary school students monitored their moods and alcohol use for 20 random days during a one-month period. Researchers found that adolescents who consume moderate amounts of alcohol, as compared to light or heavy amounts, on a single drinking occasion “experienced an increase in positive mood over the three days leading up to and three days following a drinking event” (Crooke et al., 2013, p. 262). This study demonstrated
how smartphones may be used to collect real-time data that may be used to better understand
teen motivations for alcohol consumption and to help guide interventions.

**Summary of MHMAs.** Oversight and standards for eHealth and mHealth are in the
infancy stage. With this fact in mind, developers, practitioners and consumers are encouraged to
be cautious about claims of app promoters, to be diligent in researching the credentials of the
developers, and to compare apps to existing eHealth standards as well as professional association
standards. It is also critical for health practitioners to serve as consultants to inform developers
regarding theory (Choi et al., 2014) and epistemology. On the other hand, it is important not to
allow concerns and cautions to override reaping the benefits of effective eHealth and mHealth
technologies. With thousands of apps on the market, counselor education programs would be
remiss not to train future counselors to be effective evaluators and users of evidence-based
MHMAs.

**Technology Adoption Research**

Technology adoption research is a useful lens for understanding what factors influence
counselor educators’ intentions to teach (or not teach) future counselors about emerging
technologies such as MHMAs. Integration of two theoretical models guided this study: unified
theory of acceptance and use of technology (UTAUT) by Venkatesh et al. (2003) and innovation
diffusion theory (IDT) by Rogers (2003). While there is overlap because IDT is included within
UTAUT, the former is examined in its own right because of its applicability to counselor
education regarding emerging technologies. Tracing the evolutionary process of UTAUT and
IDT is necessary for a clear understanding of these theories.

**Development of UTAUT.** For his dissertation at Sloan School of Management MIT,
Fred Davis (1989) conducted a study designed to predict and explain user acceptance of
technology. His work was published in *MIS Quarterly* and *Management Science* (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) during the 1980s, when home computers were becoming commonplace. Davis’s work was revolutionary in the world of innovations and emerging technologies in that a wealth of future research on technology acceptance would be built on what came to be called the technology acceptance model (TAM) as seen in Figure 11.

In the development of TAM, Davis converged a variety of prior theories including behavioral intention theories (Fishbein & Ajzen, 1975); the influence of perceived usefulness on system utilization (Robey, 1979, as cited in Davis, 1989; Schultz & Slevin, 1975, as cited in Davis, 1989); attitudes as antecedents of beliefs (Weiner, 1986, as cited in Davis, 1989); expectancy-theoretic model (Vroom, 1964, as cited in Davis 1989); self-efficacy theory (Bandura, 1982); the cost-benefit paradigm (Beach & Mitchell, 1978, as cited in Davis, 1989); and adoption of innovations (Rogers & Shoemaker, 1971, as cited in Davis, 1989). As Davis compared and contrasted the existing theories related to technology acceptance, he noted,

. . . a striking convergence among the wide range of theoretical perspectives and research studies . . . from multiple disciplinary vantage points, perceived usefulness and perceived ease of use are indicated as fundamental and distinct constructs that are influential in decisions to use technology (Davis, 1989, p. 3).
Based on his convergent theoretical understanding, Davis (1989) designed a multi-item scale to further investigate the roles of perceived usefulness and ease of use in one study on use of electronic mail use and another on use of two IBM PC-based graphic systems. Results from both studies suggested “ease of use operates through usefulness” (p. 332). While “both perceived usefulness and ease of use were significantly correlated with self-reported indicants of system use” (p. 333), “usefulness was significantly more strongly linked to usage than was ease of use” (p. 333). Davis (1989) explained, “Although difficulty of use can discourage adoption of an otherwise useful system, no amount of ease of use can compensate for a system that does not perform a useful function” (p. 333-334).

Citing the problem of continuing underuse of systems, 11 years after Davis’s 1989 article, Venkatesh and Davis (2000) extended the TAM and developed the TAM2 (Figure 12),
further advancing understanding of user adoption behavior. They tested the TAM2 with four different systems at four organizations (N =156) and especially considered voluntary versus mandatory usage. Venkatesh and Davis (2000) found “perceived usefulness and perceived ease of use remained consistent significant determinants of intention across all time periods in all four studies” (p. 195). The results also indicated social influence processes, cognitive instrumental processes (job relevance, output quality, and result demonstrability), and perceived ease of use influenced user acceptance, but when usage was mandatory, social influence did not have a direct influence on intention to use.

Figure 12. TAM2 results pooled across studies and time periods. From “A theoretical extension of the technology acceptance model: Four longitudinal field studies,” by Viswanath Venkatesh and Fred D. Davis, 2000, Management Science, 46(2), p 197. Copyright 2000 by the Institute for Operations Research and the Management Sciences (INFORMS), Reprinted by permission (Appendix M).
Venkatesh and Bala (2008) authored the TAM3 (Figure 13) revision from an organizational point of view in order to assist managers in making IT decisions. They traced the history, criticisms, and gaps in the prior models and indicated that, as of December 2007, Google Scholar listed over 5,000 citations to Davis’s original 1989 articles that introduced TAM. Venkatesh and Bala (2008) also indicated that across studies, “TAM consistently explains about 40% of the variance in individuals’ intention to use an IT and actual usage” (p. 276). In developing the TAM3 model, the influence of hands-on experience over time was investigated.

*Figure 13. Technology acceptance model 3 (TAM3). From “Technology Acceptance Model 3 and a Research Agenda on Interventions,” by Viswanath Venkatesh and Hillol Bala, 2008, Decision Sciences, 39(2), p. 280. Copyright 2008, Decision Sciences Institute. Used with permission (Appendix N).*
Three years after the TAM3, came the UTAUT (Venkatesh et al., 2003); this was an effort to formulate a unified model combining eight different models of IT acceptance, “These eight models had explained between 17% and 53% of variance in user intentions to use information technology” (p. 425) but when UTAUT was confirmed, it was found to explain “70% of variance in intention” (p. 471) to use technology. According to Venkatesh et al. (2003), the UTAUT is a useful tool for managers to use in predicting success of new technology and in designing interventions to promote adoption.

![Diagram of UTAUT model](image)

**Explanation of UTAUT variables.** In Figure 14, the four constructs on the left are direct determinants of the outcome variables, behavioral intention to use an innovation, and usage behavior. Gender, age, experience, and voluntariness of use are key moderators. Venkatesh et al. (2003) presented a thorough breakdown of how the constructs from each of the eight related theories were included in the UTAUT model. For the purpose of this literature review, a simplified definition of each construct is provided.

**Direct determinants of use behavior.**

- **Performance expectancy** is the degree to which an individual believes that using the system will contribute to gains in job performance. Relative advantage from IDT is included within performance expectancy. Venkatesh et al. (2003) highlight the significance of this variable, “Performance expectancy . . . is the strongest predictor of intention and remains significant at all points of measurement in both voluntary and mandatory settings” (p. 447).

- **Effort expectancy** is “the degree of ease associated with use of the system” (Venkatesh et al., 2003, p. 450). Among constructs drawn from other theories, ease of use from IDT is a closely related term. Venkatesh et al. (2003) noted that effort expectancy is significant in both voluntary and mandatory contexts, but only during the first time period, because more effort is often required in the early stages of implementing new behaviors.

- **Social influence** is the degree to which an individual perceives that the new system should be used (Venkatesh et al., 2003, p. 451) and includes a belief about how others will perceive a person who has used the particular technology. While the social influence constructs were significant in voluntary contexts, social
influence is significant in mandated contexts. The term *subjective norm* is a closely related construct that was used in several other theories. The term *image* is the most closely related IDT term.

- *Facilitating conditions* are “the degree to which an individual believes an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453). *Compatibility* is the most closely related term from IDT.

**Outcome variables.**

- *Behavioral intention* is consistent in all the eight intention models used in UTAUT, and behavioral intention to use has been repeatedly found to have a “significant positive influence on technology usage” (Venkatesh et al., 2003, p. 456).

- *Use behavior* is measured by users’ actual frequencies of technology use.

**Moderating variables.**

- *Gender differences* moderated the relationship between performance expectancy and intention, particularly with a younger cohort of workers, based on research about the psychological basis of gender roles.

- *Age* has been shown to be a moderator in technology adoption; gender and age often interact.

- *Experience level* with a technology has been shown to influence technology adoption.

- *Voluntariness of use* refers to whether or not using a technology is required or mandatory.
After formulating UTAUT, Venkatesh et al. (2003) empirically validated the model and then performed cross-validation using data from two more organizations. The researchers summarized their findings:

These tests provided strong empirical support for UTAUT, which posits three direct determinants of intention to use (performance expectancy, effort expectancy, and social influence) and two direct determinants of usage behavior (intention and facilitating conditions). Significant moderating influences of experience, voluntariness, gender, and age were confirmed as integral features of UTAUT. (Venkatesh et al., 2003, p. 467)

It is worth restating the UTAUT explained as much as 70% of the variance in intention; therefore, “it is possible that we may be approaching the practical limits of our ability to explain individual acceptance and usage decisions in organizations” (Venkatesh et al., 2003, p.471).

**Innovation diffusion theory (IDT).** Even though Venkatesh et al. (2003) included innovation diffusion theory (IDT) by Rogers in the UTAUT model, it is important to highlight the relevance of IDT for this study. Rogers (2003) identified himself as a diffusion scholar who spent his professional career studying adoption of innovations and the innovation-decision process with a variety of innovations in many different countries. In the preface (the 5th edition) Rogers (2003) stated, “This book is about regularities in the diffusion of innovations, patterns that have been found across cultures, innovations, and the people who adopt them. The diffusion of innovations explains social change, one of the most fundamental of human processes” (para. 9). IDT provides greater depth regarding how an innovation is diffused throughout a system. Consequently, more insight into IDT may be helpful in understanding the diffusion of digital technologies in the field of counselor education, a field that is lagging so far behind other fields in regards to technology adoption. For a dissertation, Powers (2003) summarized IDT:
Rogers described an innovation as an idea, object, or practice that is perceived to be new by the individual and diffusion as the process through which an innovation is communicated through certain channels over time among members of a social system. (p. 7)

Rogers indicated that the meaning of an idea is gradually worked out through a process of social construction. He proposed the social process to be particularly influential in innovation adoption. Rogers’ (2003) term for an individual’s decision to adopt an innovation is attributes. Attributes include (a) relative advantage of an innovation over prior ideas; (b) compatibility with the needs of potential adopters; (c) complexity of use of the innovation; (d) trialability, or how the innovation may be tested in a timely fashion; and (e) observability of the outcomes (Hansen, 2008). Kuhn et al. (2014), in their study of the PE Coach app, summarized IDT:

In short, innovations that are perceived as being better than those currently being used, that are consistent with clinicians’ values, needs, and settings, are easy to use, are observable to others, and are able to be experimented with before being fully adopted will spread more quickly than will those lacking these perceived characteristics. (p. 801)

Another important contribution of IDT is the adopter categories defined by Rogers (2003): (a) innovators (2.5%) are venturesome, educated, and have extended access to information; (b) early adopters (13.5%) are popular, successful social leaders; (c) early majority (34%) are deliberate and highly connected in their social system; (d) late majority (34%) are skeptical, have limited economic resources, and a low tolerance for uncertainty regarding new ideas; and (e) laggards (16%) are traditional, suspicious of new things, and tend to rely on the leadership of others regarding adoption decisions.
**Importance of the term relevance in eHealth adoption.** Spil and Schuring (2006) focused on “the world of diffusion of information systems in healthcare” in their book, *E-health Systems Diffusion and Use*. Since mHealth is included within the field of eHealth, the collection of research articles summarized by Spil and Schuring are pertinent to diffusion of MHMAs in counselor education systems, particularly since counseling falls under the broad heading of healthcare. One article discussed by Spil and Schuring was by Chismar and Wiley-Patton (2002) regarding a test of the TAM2 for the Internet in pediatrics. The study by Chismar and Wiley-Patton highlighted factors particularly germane to physicians when considering diffusion of innovation: attitudes of physicians and relevance of innovations for physicians’ work. The term relevance is captured by the term perceived usefulness in the TAM by Davis (1989) and by the term performance expectancy in the UTAUT by Venkatesh et al. (2003). Spil and Schuring (2006) defined relevance as “the degree to which the user expects that the IT system will solve his or her problems or help to realize the actually relevant goals” (p. 156). In summarizing their study in regard to relevance, Chismar and Wiley Patton (2002) said, “Our study suggests that pediatricians are willing to adopt and use Internet-based health applications if those applications are perceived as beneficial in helping the physician to accomplish his or her daily task” (p. 158). Spil and Schuring (2006) captured the importance of this finding regarding relevance with physicians, “The main result of the work of Chismar and Wiley-Patton is that job relevance is the most important determinant of e-health success” (p. xi).

In pondering the significance of perceived usefulness on physicians’ usage intentions, Chismar and Wiley-Patton (2002) surmised that physicians may be “willing to adopt beneficial applications of technology even if they may not be easy to use” (p. 158). This willingness may be due to the “overall competency level of physicians” (Chismar & Wiley-Patton, 2002, p. 158).
The researchers further explained that as a user’s competency level increases, the perceived ease of use factor may weaken. Based on their findings, Chismar and Wiley-Patton recommended the development of a modified version of TAM2 for use in evaluating physicians’ attitudes toward Internet-based health innovations. They also advocated for more research examining technology adoption across “specialties, disciplines, geographic boundaries, and cultures” (Chismar & Wiley-Patton, 2002, p. 159). Chismar and Wiley-Patton’s recommendations relate well to the purpose of this study: evaluation of the healthcare subculture of counselor educators in relation to adoption of the emerging MHMA technologies.

Spil et al. (2006) wrote an article entitled *USE-IT: The Theoretical Framework Tested on an Electronic Prescription System for General Practitioners* in Spil and Schuring (2006). This chapter was deemed the “heart of the book” (p. 147) and represents five years of work on diffusion of eHealth systems (p. 147). The USE-IT model has four determinants in diffusion and use of information systems: resistance, relevance, requirements, and resources. The researchers found resistance to be “the cumulative consequence of effects of the other determinants” (Spil et al., 2006, p. 169). This finding is significant because “many studies work on the effect and not on the cause of the lack of IT use” (Spil et al., 2006, p. 169). Further, they indicated relevance to be “the most important determinant for failure of diffusion and use of the system” (Spil et al., 2006, p. 169).

**Summary of technology adoption research.** This literature review of technology adoption research highlights the need to use the UTAUT and IDT as a conceptual lens for studying the adoption of MHMAs by counselor educators. The eHealth technology adoption studies also point to the need to consider relevance as an important variable in adoption of technologies by counselor educators as a subculture within the field of healthcare.
Summary of the Literature Review

This literature review was used to describe research relevant to a study on counselor education regarding MHMAs. Various counseling-related instructional training programs were defined along with ethical standards for counselor education and for using technologies in education and practice. Ethical standards pinpointed the duty to do no harm, to do only what is good for clients, to exercise within the boundaries of competence, to pursue training in new technologies, and to promote social justice. CACREP, ACES, and ISTE standards were reviewed regarding accreditation of counselor education programs and the need to develop technological competence and technological literacy in counselors. Because no existing studies were found on counselor education regarding MHMAs, studies on counselor education regarding other types of counseling-related technologies were reviewed. Prensky’s (2001) generational differences between digital immigrants and digital natives were highlighted as an important consideration for a study on counselor education regarding MHMAs. In addition, the counselor education literature review regarding continuing education at counselor professional conferences indicated hyperfocus on ethical concerns of new technologies at the expense of reaping the benefits of evidence-based mental health technologies. The importance of infusing existing and emerging technologies into and across all aspects of counselor education synthesizes this section of the literature review.

The evolution of MHMAs as mHealth innovations was also outlined. Statistics on use of mobile phones and mobile apps were provided, indicating unprecedented growth in the use of mobile applications for health and mental health care. Global and national government and organizational initiatives in the eHealth and mHealth arenas were reviewed regarding the potential of mobile technologies to transform health service delivery. Challenges and cautions of
MHMAs found in the research indicated the need for considering technology use and adoption theories in the development of apps, the need for standards and oversight of mobile health apps, the need for attention to matters of client safety and client data security, and the need to consider efficacy-based research on MHMAs. Through the literature review, evidence on the efficacy of MHMAs and mobile treatment interventions was investigated. Several were noted to have merit in improving mental health. Because counselors are ethically required to develop competence in treatment modalities, counselor educators need to gain the necessary training to teach counseling students how to use and integrate evidence-based MHMAs into clinical practice.

Also traced in the literature review was the evolution of technology use and acceptance theories and diffusion of innovation theories. These theories are useful in understanding the variables that influence intention to use emerging technologies. Variables identified in the literature review in UTAUT, IDT, Prensky’s (2001) generational lens, and in ethical codes were used to customize an instrument for gathering data from counselor educators on the topic of counselor education regarding emerging MHMA technologies. It is now appropriate to blend understanding of the field of counseling, counselor education, counselor technological competence, the field of mHealth and emerging MHMAs, and technology use and adoption theories into an approach for evaluating the topic of counselor education regarding MHMAs. Attention is now directed to research design and method.
CHAPTER III

METHODOLOGY

This chapter explains the method and procedures used to investigate the central topic of mental health mobile apps (MHMAs) in counselor education. Reasons for choosing the sequential explanatory mixed methods research design are identified. The central research questions, along with specific quantitative, qualitative, and mixed methods research questions are reviewed. Data collection instruments are described, along with participant recruitment methods and the procedural steps for conducting the study. The statistical approaches for data analyses are also defined.

Central Research Questions

The purpose of this study was to investigate counselor educators’ perceptions of MHMAs and the extent to which counselor education programs are training future mental health professionals to evaluate and integrate MHMAs into clinical practice. A sequential explanatory mixed methods study was used to yield depth and breadth of insight. For clarity, the three central research questions as identified in chapter one are restated: (a) What factors influence counselor educators’ values of MHMAs as therapeutic tools? (b) What factors influence counselor educators’ behavioral intentions to teach counseling students about MHMAs? and, (c) To what extent are counseling programs contributing to future counselors’ technological competencies regarding their ability to evaluate and integrate MHMAs?

Research Design

As a foundational worldview, the overall sequential explanatory mixed methods design was guided by pragmatism. Creswell and Plano Clark (2011) credit Tashakkori and Teddlie (2003) with formally linking pragmatism to mixed methods research. Pragmatism, drawn from
many ideas from many people, uses diverse approaches; pragmatism values objective and subjective knowledge (Creswell & Plano Clark, 2011). Regarding pragmatism, Gall, Gall, and Borg (2007) state, “Pragmatists such as Charles Sanders Pierce, William James, and John Dewey argued that the truth value of a concept, idea, method or other entity is determined by whether it has pragmatic—that is, useful—consequences” (p. 33). In a sequential explanatory mixed methods design, a subjective qualitative strand flows out of the first objective quantitative strand, and data from both strands are then integrated and synthesized in a mixed methods analysis.

Morgan (2007), demonstrated how a pragmatic mixed methods approach is dualistic and “rejects the need to choose between a pair of extremes” (p. 72): Information learned from one method in one setting may be maximized for use in other methods and settings. Morgan described this approach as a process of working back and forth, a process that emphasizes shared meanings and joint action. Creswell and Plano Clark (2011) stated pragmatism “enables researchers to adopt a pluralistic stance of gathering all types of data to answer a research question” (p. 46) and further indicated that a pragmatic approach permits a researcher to tie differing philosophical worldviews to different phases of the project. Furthermore, Tashakkori and Teddlie (2010) state:

We believe that the mixed approach closely parallels everyday human problem solving in a way that neither qualitative nor quantitative methods alone can do. Everyday problem solvers use multiple approaches (similar to qualitative and quantitative pathways) concurrently or closely in sequence and examine a variety of sources of evidence in decision making (and in forming impressions). (p. 273)
Jick (1979) agrees, indicating that qualitative and quantitative methods “should be viewed as complementary rather than as rival camps” (p. 602). Using mixed methods in the research design is known as triangulation and refers to using multiple viewpoints to obtain greater accuracy.

For the initial non-experimental comparative quantitative strand survey, a postpositivist worldview guided the use of specific variables and empirical measures (Creswell & Plano Clark, 2011) drawn from the theoretical framework. This strand was framed within technology acceptance and use theory. Interviewing counselor educators in the qualitative strand reflected a shift away from the postpositivist to a constructivist perspective: The interviews helped construct and reveal multiple meanings and deeper insights than the surveys could yield if used exclusively. Merging these two worldviews in the final mixed methods analysis was pragmatic as the design used multiple methods and worldviews to inform the topic (Creswell & Plano Clark, 2011).

Permissions and Informed Consent

The University of West Florida Institutional Review Board (IRB) for Human Research Participants Protection approval for this mixed methods sequential explanatory design was obtained prior to study initiation (Appendix E). The IRB approval was amended to extend the data collection date (Appendix F). A second IRB modification was approved to expand the participant pool, to reduce the time commitment, and to increase the compensation for participants based on the pilot study (Appendix G). After receiving IRB approval, I commenced with the pilot study. For the pilot study, permission letters were sent to program chairs or the accreditation liaisons in CACREP-accredited programs. Many educators indicated that the nature of this study did not require university-level permission and suggested I directly contact the professors via the publicly listed email addresses on the universities’ websites. Six required
university-level permission from their respective IRB offices. Of these six, two gave permission and one denied permission as a result of being inundated with research requests; this IRB office labelled this rationale as research fatigue. Because of time constraints involved with applying and waiting for IRB approval from the remaining three universities, application for IRB approval was not submitted, and professors from these universities were not invited to participate in this study.

An informed consent document (Appendix H) was attached to the participant recruitment emails along with the IRB approvals. Defined in the informed consent was the purpose of the study, the time requirements, the activity requirements, risks, information about confidentiality and anonymity, data access and storage, and freedom to withdraw. Risk to the human participants was minimal as no treatment was applied. The informed consent also addressed compensation. In the first wave of pilot study invitations to participate, not one professor responded. The time requirement was over an hour and a $10 gift card was offered for compensation. This lack of response was the reason behind increasing the sample pool, decreasing the time commitment, and increasing the compensation. The IRB approved an increase in compensation from a $10 gift card to a $40 gift card per participant for a 45-50 minute time requirement. $40 gift cards were also given to the 10 professors who participated in the qualitative interviews.

**Quantitative Strand Setting, Participants, and Sampling**

Counselor educator participants were recruited through the CACREP database of accredited counseling programs, Masters in Psychology and Counseling Accreditation Council (MPCAC) database of accredited counseling programs, APA-accredited counseling psychology programs, and CSWE-accredited social work programs. These sites listed the names of
accredited universities. University websites were then consulted for email addresses of counseling professors, and these addresses were built into an email database. Inclusion criteria for quantitative strand participants were (a) must be a current counselor educator employed in a graduate counselor education program; (b) must have a mobile smartphone and be willing to download the PE Coach app; and (c) must be willing to evaluate the PE Coach app and complete a post-MHMA evaluation survey. Educators completed the surveys online through SurveyMonkey.

According to Creswell and Plano Clark (2011) when conducting a sequential explanatory mixed methods design, participants are selected from the quantitative strand to sample in the second, qualitative strand. Participants representing digital immigrants, digital natives, public universities, private universities, and counseling programs offering online degrees were selected from the quantitative sample and were asked to participate in the qualitative strand. Ten educators participated in these interviews. Sampling strategies by participant type and research strand are further explained.

In the original proposal for this study, the largest sample size needed was for question one with nine independent variables to be analyzed with multiple regression analysis. Based on the pilot study, two of the variables were combined into one scale (performance expectancy and expected benefits). In addition, in reviewing the data collected in the study, it was determined to be too confusing to measure trialability along with the other variables in research question one. Therefore, the trialability variable was dropped from question one and analyzed separately in research questions eight and nine.

The number of participants needed was originally based on the dissertation proposal with the nine independent variables in question one. Cohen’s (1992) article on statistical power in
quantitative research along with a sample size calculator (Sample Size Calculator, 2015) indicated that 113 participants were needed to obtain the desired power level of .80 with an alpha level (α) of .05 for multiple regression with eight independent variables. For the revised research question one with seven independent variables and one dependent variable, Cohen recommends a minimum sample size of 102 for statistical power of .80 with a medium effect size, and a .05 alpha level. Surveys were completed by 132 educators, providing a sufficient number of participants to obtain the desired statistical power even after dropping those surveys that were incomplete or had no variance in responses (a few participants checked the same response box throughout the survey).

The original proposal plan was to sample educators from CACREP counselor education programs only. Based on difficulties encountered in the pilot study in recruiting enough participants, however, the decision was made to expand the participant pool to include educators in all mental health related graduate-level counselor education programs, including programs in counseling, marriage and family therapy, addictions counseling, school counseling, social work, psychology, and psychiatry. The inclusion of educators from all of these mental health related programs enhanced the study and offered multiple perspectives from educators teaching in related fields. For the quantitative survey, 2,699 counselor educators’ email addresses were entered into the database and invited to participate.

**Quantitative Strand Instruments**

The instruments were based on the UTAUT by Venkatesh et al. (2003), Rogers’ (2003) innovation diffusion theory, Prensky’s (2001) generational categories, and the focus on ethics in the practice of counseling. The service oriented unified theory of acceptance and use of technology (SOUTAUT) instrument designed by Tibenderana, Ogao, Ikoja-Odongo, and
Wokadala (2010) for their study on library end-users’ acceptance and use of e-library services, was used as a foundation for this study’s instruments. The SOUTAUT is relevant to this study as it is based on Venkatesh et al.’s (2003) UTAUT. The SOUTAUT was piloted at a professional conference, and two information systems (IS) experts critically scrutinized the instrument. Tibenderana et al. (2010) methodically conducted a validity and reliability study on the SOUTAUT. They reported scale reliabilities, construct validity, discriminant validity, factor analysis, and “path coefficients and $R^2$ to evaluate the entire model analysis and goodness of fit” (p. 43). The service-oriented spin on the SOUTAUT is also applicable to counseling, a service-oriented field. Tibenderana (personal communication, November 8, 2013) gave permission (Appendix A) for SOUTAUT (Appendix B) to be modified for use in this study.

For the quantitative strand, participants were sent a SurveyMonkey link to a four-part survey (Appendix C). Pilot testing of this instrument is explained in the next section. Survey Section 1 was a pre-MHMA evaluation for collecting demographic data, counselor educators’ professional statuses, mobile phones and mobile apps’ use information, and information about university courses on emerging technologies. Section 2 was a pre-MHMA evaluation survey designed to investigate variables influencing behavioral intentions to teach students about MHMAs and educators’ perceived values of MHMAs. Section 3 was an evaluation of the PE Coach app (Appendix D). This app was developed by T2 (2015a).

To determine which MHMA for counselor educators to evaluate in Section 3, primary importance was given to ethical admonishments to use evidence-based and relevant mental health technologies. In addition, the MHMA selected for evaluation needed to be available on both Android and iOS platforms. The original plan had been for participants to evaluate two apps that met this criteria, the PE Coach app and an app that is used in conjunction with dialectical
behavior therapy, DBT Self-Help app developed by Cognitus Psychotherapy and Development. According to the Cognitus website, DBT Self-Help app is a self-help tool but may also be used in conjunction with psychotherapy. The app is designed to help users better understand the interaction between thoughts, emotions, physiology, and behaviors; to enhance healthy relating and communication; to better cope with overwhelming emotions; to alter behaviors in order to increase positive emotions; and, to increase mindfulness, awareness, and concentration. Two other DBT-related apps were considered: One was still in development, and the other was ruled out as it was not available on both the iOS and Android platforms.

When the pilot study indicated an inability to get enough professors to participate in a survey that would take nearly two hours, the decision was made to drop the DBT Self-Help app evaluation. DBT Self-Help app was selected to be omitted for three reasons. First, participants would have needed individual download codes from the developer in order to avoid paying the $8.99 app fee. The developer did agree to provide codes; however, providing individual codes to each participant would have been cumbersome and time-consuming in contrast with the PE Coach app that was free and easy to download from both the Apple™ and Google Play™ app stores. In addition, the PE Coach app was developed by T2 and this provided name recognition and app credibility, particularly for participants who may have been hesitant about security issues arising from an app downloaded from an unfamiliar organization. Lastly, during the course of this research project, DBT Self-Help app was pulled from the app stores for modification (A. Nordlund, personal communication, June 24, 2014). Though the developer agreed to provide access codes, I was concerned that participants may become confused by the lack of ability to find the app in the app stores.
The prolonged exposure therapy PE Coach app discussed in the literature review has a strong research base, is relevant to clinical practice, and is available on Android and iPhone platforms (Appendix D). As mentioned, it is a free download. PE Coach is designed to be used in conjunction with psychotherapy with a behavioral health provider who is trained in prolonged exposure therapy. The goal of the app is to process traumatic experiences to reduce anxiety and fear (Kuhn et al., 2014). Because the app is publicly available and this study is not connected with the Department of Defense (DOD), permission from the DOD was not required (N. Bush, personal communication, June 24, 2014).

After completing the evaluation of the PE Coach app, participants then completed Section 4, a postmeasure, which was identical to Section 2. The purpose of comparing the Section 4 scores with the Section 2 scores was to measure the influence of trialability (Rogers, 2003) on behavioral intentions to teach counseling students about MHMAs and perceived values of MHMAs. Trialability, as used in this study, is the degree to which MHMAs may be experimented with on a limited basis; trialability offers the opportunity to learn by doing. MHMAs that may be easily tried will have more rapid rates of adoption than MHMAs that may not be easily tried (Rogers, 2003).

**Pilot Study of Quantitative Instrument for Determining Validity and Reliability**

As recommended by Colton and Covert (2007), the instruments modified for use in this study were first peer-reviewed to assess validity and to determine if items were sensible and clear. A pilot study was then conducted with counselor educators as participants. Scale analysis was conducted with SPSS, and this led to modification of some scale items to improve reliability.
**Peer review of quantitative instruments.** Four peers completed the quantitative instruments and provided feedback. Two were college professors with master’s degrees. One was a licensed mental health counselor working in a private group practice. The fourth peer was a school guidance counselor with a doctorate degree. Three peers completed the evaluation of the two MHMAs on iPhones, and one completed the app evaluations on an Android platform. At the time of the pilot study, the survey was presented in two parts in order to plan for the evaluation of the DBT Self-Help app which would have required app download codes. Peers were provided with the links to both surveys, Sections 1-2 and Sections 3-4. After completing the surveys and providing feedback, these peers were each given a $30 Amazon gift card for compensation. Individual responses and collective data were saved to .pdf files and .exl files. The peer review responses were then cleared from SurveyMonkey in order to make the suggested changes to the instrument.

Peer reviewers indicated that the survey directions were clear, they had no problems accessing the online instruments, they had no problems downloading the two selected apps, and they found no spelling or grammatical problems. Most indicated no problems with the organization and flow. The school counselor peer with the doctorate degree said,

The surveys moved quickly. There were an appropriate number of questions. I believe the questions were useful and I did not feel trapped in the survey. It moved quickly and the questions were relevant and engaging. I think it is a solid survey process that will yield desired analytic data.

Regarding the organization and flow, one peer reviewer said,

I did not encounter any problems with the organization and flow. I do like how the questions changed from agreement to disagreement. It kept you on your toes and kept
you from giving the same response to each question.

One of the college professor reviewers, however, suggested further separating the instrument into additional categories. This suggestion was implemented.

One reviewer who is also a college professor indicated difficulty with the time requirement and expressed concern about finding enough counselor educator participants who may be willing to give two hours of time to this project. This peer also indicated some difficulty with the survey because of a lack of background in counseling; this lack of experience likely contributed to its requiring more time for this reviewer to complete the surveys than it did those with counseling-related experience. Another peer also expressed concern about the two-hour time requirement.

Peer reviewers indicated that the survey had face validity and content validity; they indicated that the survey appeared to be measuring attitudes of counselor educators toward MHMAs in counselor education, which is the topic of this study. Reviewers indicated that there were no additional questions that should be included to adequately investigate the topic. Reviewers indicated that the language was appropriate for graduate level counselor educators. Additional recommended changes were made to eliminate confusion in each sections’ directions and to enhance clarity of survey items.

**Pilot study of quantitative instruments.** A test-retest approach to determining instrument reliability was ruled out as a result of the potential of history and time confounding the data. If for example, pilot study participants completed Sections 1-2 at Time 1 and then were asked to complete these same sections again at Time 2, the period of time in between test administrations could confound the data. To further explain, if participants had never been exposed to MHMAs and the Time 1 administration piqued their interest about MHMAs, they
may have taken initiative to learn more about MHMAs prior to the Time 2 administration. This information would have potentially contributed to a change in their responses at Time 2 and would have interfered with determining item reliability. For this reason, analyses of internal consistency scores was selected as the best approach to determining reliability (Gliem & Gliem, 2003; Tavakol & Dennick, 2011). Internal consistency was also deemed appropriate because multiple items are used in the instruments to measure each independent variable, allowing for comparison between items designed to measure each variable. In addition, variables measured are drawn from the UTAUT, an instrument that has undergone much prior reliability testing in order to become a unified theory of technology use and acceptance (Venkatesh et al., 2003).

It is important to note that Section 3, evaluation of the PE Coach app, was completed only for the purpose of investigating the influence of trialability. Section 3 was used to get educators to interact with an evidence-based app and to evaluate it from the perspective of a counselor educator. No hypotheses were based on the scales and data collected in Section 3 and for this reason, the internal consistency analyses is reported for the scales in Section 2 only. After deleting items suggested by the internal consistency scale analyses, Cronbach’s alpha for the scales in Section Two (which is the same as Section Four) were determined. Table 1 indicates Cronbach’s alpha internal consistency scores before and after deleting items.
Table 1

*Pilot Study Section 2: Comparison of Cronbach’s Alphas Before and After Items were Deleted*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Initial Cronbach’s Alphas</th>
<th>Final Cronbach’s Alphas After Deleting Items</th>
<th>Final No. of Scale Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy /Relevance</td>
<td>.861</td>
<td>.927</td>
<td>12</td>
</tr>
<tr>
<td>Effort Expectancy</td>
<td>.586</td>
<td>.805</td>
<td>3</td>
</tr>
<tr>
<td>Attitude</td>
<td>.919</td>
<td>.873</td>
<td>6</td>
</tr>
<tr>
<td>Social Influence</td>
<td>.795</td>
<td>.819</td>
<td>3</td>
</tr>
<tr>
<td>Facilitating Conditions</td>
<td>.682</td>
<td>.705</td>
<td>4</td>
</tr>
<tr>
<td>Anxiety/Apprehension</td>
<td>.857</td>
<td>.878</td>
<td>3</td>
</tr>
<tr>
<td>Behavioral Intentions To Teach Students About MHMAs</td>
<td>.921</td>
<td>.921</td>
<td>5</td>
</tr>
<tr>
<td>Voluntariness of Use</td>
<td>.260a</td>
<td>.742</td>
<td>3</td>
</tr>
<tr>
<td>Ethical Concerns</td>
<td>.660</td>
<td>.882</td>
<td>3</td>
</tr>
</tbody>
</table>

*This low score alerted the researcher to the need to correct the scoring on some items in this scale to be reverse scored.*

**Pilot study instruments.** Only Sections 1-2, and Section 3b (PE Coach app evaluation) of the survey were included in the pilot study. Because section 4, the postmeasure instrument, was identical to Section 2, there was no need for pilot study participants to complete both Section 4 and Section 2. Sections 3a and 3b of the pre-pilot survey instrument were identical mental health mobile app evaluations. For the pilot study, it was deemed unnecessary for pilot participants to evaluate both of the originally selected mental health apps. Therefore, only Section 3b, the evaluation of the PE Coach app, was used for the pilot study. For Pilot Study Attempt One, participants were provided two separate survey links, one to Sections 1-2 identified as Pilot A and one to Section 3b identified as Pilot B. The directions for the instruments were modified slightly to indicate the purpose as being that of a pilot study for
reliability testing. Also, in order to eliminate confusion for pilot study participants who are educators in doctoral-level APA-accredited programs, references to master’s-level CACREP-accredited programs were changed to accredited programs.

**Pilot study participants attempt one.** As a result of anticipated difficulties in obtaining enough participants from the pool of educators in master’s-level counselor education programs for the actual study, a pool of similar participants were identified for the pilot study. The American Psychological Association offers a list of APA-accredited doctoral programs on its website. Of the types of doctoral degree programs accredited by APA, the counseling psychology degree is the most similar to the master’s-level counselor education programs. Seventy-one universities were listed as having APA-accredited doctoral-level counseling psychology programs. The programs that also had CACREP-accredited master’s-level programs were eliminated from the pilot study sample pool in order to avoid asking professors who would be included in the actual study to participate in the pilot study phase. Thirty of the 71 APA-accredited counseling psychology doctoral programs do not also have CACREP-accredited master’s-level programs. Two of the 30 are in Canada, and the rest are in the United States. A database was created of the faculty in these 30 counseling psychology doctoral programs ($N = 389$) with the goal of obtaining 30 participants for the pilot study phase. Emails were sent to these 389 professors from October 24-29, 2014.

By October 30, 2014, 34 out of the 389 potential respondents were eliminated for the following reasons: Email address no longer existed ($n = 8$); potential respondent would not be able to give an hour to an hour and a quarter of time ($n = 5$); potential respondent’s university required approval from his or her own IRB ($n = 2$); potential respondent did not meet inclusion criteria ($n = 9$); potential respondent declined with no reason offered ($n = 3$); potential
respondent did not have a smartphone ($n = 2$); potential respondent was on sabbatical ($n = 4$); and, potential respondent was retired ($n = 1$). Not one professor in the potential survey pool indicated willingness to participate in the pilot study (90-120 minute time requirement with $10 gift card compensation); consequently, no pilot surveys were completed in this attempt.

**Pilot study attempt two.** While locating participants for the pilot study, I concurrently contacted CACREP program contacts in graduate-level master’s counseling programs for permission to contact faculty for participation in the actual study. From this potential participant pool, it also became clear that the time requirement for participation in the actual study (90-120 minutes) was interfering with the ability to obtain participants. Several CACREP program contacts indicated this to be the case in response emails. Several indicated an unusually high frequency of requests for research participation by counselor educators and labelled this as *bad timing*. One online university’s IRB office indicated *research fatigue*:

> Honestly, I think your dissertation may sort of be bad timing because we’ve seen a lot of studies recently wanting to recruit from CACREP-accredited institutions, of which we are one. And we’re one of the few online ones. I wouldn’t be surprised if other institutions are also feeling research fatigue. I went back into my records and we’ve had 13 requests in the past couple months externally. This doesn’t include any research that our faculty is trying to do. Honestly, I’ve been handling this process for a few years and I’ve never seen this many requests for our counseling faculty before. (Anonymous, personal communication, October 28, 2014)

With evidence of research fatigue in mind and resistance to the time requirement, the dissertation committee chair and I made the decision to split the pilot study into two parts, with one group testing Sections 1-2 (a 10-15 minute time requirement with a $10 compensation offer) and
another group testing Section 3b PE Coach app evaluation (30 minute time requirement with a $30 compensation offer). For Sections 1-2, 178 counselor educators were invited to participate and 20 completed this 10-15 minute survey (11% response rate). Each was given a $10 Amazon gift card. For Section 3b PE Coach app evaluation, 352 counselor educators were invited to participate, and 14 completed this 30 minute survey (4% response rate). These obvious recruitment difficulties led to my chair and I deciding it was necessary to reduce the time requirement and increase the compensation for the final study. An amendment request was submitted to the IRB and approved (Appendix G), with the time requirement reduced to less than one hour by dropping the DBT Self-Help app evaluation, reducing the number of items in the survey based on the internal consistency analysis, and increasing the compensation to a $40 gift card. The increase in compensation was deemed appropriate for counselor educators in graduate counselor education departments who were giving nearly an hour of their time to this project.

Quantitative Data Collection Methods

Along with invitation emails, participants were sent an electronic copy of the informed consent, the IRB approvals, and a SurveyMonkey link to the questionnaire (Appendix C). They were also offered the opportunity to complete a paper-pencil version, but each participant selected the online survey method. By clicking on the survey link and completing the questionnaire, respondents agreed to the informed consent.

After completing the demographic and general items about MHMA-related instruction in Section 1 and the theory based questionnaire in Section 2, participants downloaded the PE Coach app to their smartphones. They interacted with the PE Coach app for a minimum of 15 minutes, then completed an evaluation of that app in Section 3. Immediately following the PE Coach app evaluation, participants completed Section 4, the postmeasure, which was identical to Section 2.
Quantitative data were entered into Statistical Package for the Social Sciences (SPSS) Version 21. Statistical analysis was performed prior to conducting the qualitative interviews. This analysis permitted the proposed interview questions to be revised to include additional questions that deepened understanding of the quantitative data.

**Quantitative Strand Research Questions, Variables, and Hypotheses**

In the first research strand, nine quantitative research questions were investigated to address the main topic of counselor education regarding MHMAs. Alternative and null hypotheses are presented for each quantitative research question.

1. Are there relationships between each of the independent variables (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d) social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns and the dependent variable, average scores on behavioral intentions to teach counseling students about MHMAs when considering the moderating influences of (a) generational category, (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use?

   **H₁:** There are relationships between average scores on each of the independent variables (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d) social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns and the dependent variable, average scores on behavioral intentions to teach counseling students about MHMAs when considering the moderating influences of (a) generational category, (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

   **H₀:** There are no relationships between average scores on each of the independent variables (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d)
social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns and the dependent variable, average scores on behavioral intentions to teach counseling students about MHMAs when considering the moderating influences of (a) generational category, (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

2. Is there a difference between the average number of health apps downloaded to the personal phones of digital immigrant counseling educators versus the phones of digital native counseling educators?

H₂: Digital native counselor educators will have a higher average number of health apps downloaded to their personal phones than digital immigrant counselor educators have downloaded to their personal phones.

H₀: There will be no difference in the average number of health apps downloaded to the personal phones of digital native counselor educators and the phones of digital immigrant counselor educators.

3. Is there a difference between the average number of MHMAs downloaded to the personal phones of digital immigrant counseling educators versus the phones of digital native counseling educators?

H₃: Digital native counselor educators will have a higher average number of MHMAs downloaded to their personal phones than digital immigrant counselor educators have downloaded to their personal phones.

H₀: There will be no difference in the average number of MHMAs downloaded to the personal phones of digital native counselor educators and the phones of digital immigrant counselor educators.
4. Are there differences between digital immigrant and digital native counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use?

H₄: Digital native counselor educators will have significantly higher average behavioral intentions to teach scores than will digital immigrant counselor educators when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use.

H₀: There will be no differences between digital native and digital immigrant counselor educators’ average behavioral intentions to teach MHMAs scores when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use.

5. Are there differences between digital immigrant and digital native counselor educators’ average values of MHMAs scores when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use?

H₅: Digital native counselor educators will have significantly higher average values of MHMAs scores than will digital immigrant counselor educators when considering the moderating influences of (a) gender, (b) pre-study level of experience with MHMAs, and (c) voluntariness of use.

H₀: There will be no differences between digital native and digital immigrant counselor educators’ average values of MHMAs scores when considering the moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.
6. Does level of online counselor educator course offerings influence counselor educators’
average behavioral intentions to teach counseling students about MHMAs scores when
considering the moderating influences of (a) generational category (b) gender, (c)
pre-study level of experience with MHMAs, and (d) voluntariness of use.

\( H_6 \): Level of online counselor educator course offerings will significantly influence
counselor educators’ average behavioral intentions to teach counseling students about
MHMAs scores when considering the moderating influences of (a) generational category
(b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

\( H_0 \): There will be no differences between level of online counselor educator course
offerings and counselor educators’ average behavioral intentions to teach counseling
students about MHMAs scores when considering the moderating influences of (a)
generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d)
voluntariness of use.

7. Does level of online counselor educator course offerings influence counselor educators’
average total values of MHMAs scores when considering the moderating influences of (a)
generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d)
voluntariness of use.

\( H_7 \): Level of online counselor educator course offerings will significantly influence
counselor educators’ total values of MHMAs scores to teach counseling students about
MHMAs scores when considering the moderating influences of (a) generational category
(b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

\( H_0 \): There will be no differences between level of online counselor educator course
offerings and counselor educators’ total values of MHMAs scores when considering the
moderating influences of (a) generational category (b) gender, (c) pre-study level of experience with MHMAs, and (d) voluntariness of use.

8. What is the effect of trialability on counselor educators’ average behavioral intentions to teach counseling students about MHMAs scores? Restated, is there a significant difference between counselor educators’ average behavioral intentions to teach students about MHMAs scores before and after interaction (trialability) with one evidence-based MHMA, the PE Coach app?

Hₐ: The average behavioral intentions to teach students about MHMAs scores will be significantly higher after interaction with an evidence-based MHMA, the PE Coach app.

H₀: There will be no difference in the average behavioral intentions to teach students about MHMAs scores before and after interaction with an evidence-based MHMA, the PE Coach app.

9. What is the effect of trialability on counselor educators’ average total values of MHMAs scores? Restated, is there a significant difference between counselor educators’ average total values of MHMAs scores before and after interaction (trialability) with one evidence-based MHMA, the PE Coach app?

Hₐ: The average total values of MHMAs scores will be significantly higher after interaction with an evidence-based MHMA, the PE Coach app.

H₀: There will be no difference in the average total values of MHMAs scores before and after interaction with an evidence-based MHMA, the PE Coach app.

**Quantitative Strand Data Analysis Methods**

Data from the quantitative instruments were first transferred from SurveyMonkey™ into Excel, and then entered into SPSS. Data analyses were conducted in order to determine the
correct decisions regarding rejecting or not rejecting each of the nine null hypotheses.

Descriptive statistics and other appropriate steps were taken to determine if assumptions were met prior to conducting the inferential statistic for each research question.

R1. The inferential statistical method was hierarchical multiple regression, selected for its ability to handle the covariates, the multiple independent variables, and the dependent variable. The independent variables entered into SPSS were (a) performance expectancy/relevance, (b) effort expectancy, (c) attitudes, (d) social influence, (e) facilitating conditions, (f) apprehension/anxiety, and (g) ethical concerns. These independent variables were entered as interval-level measurements and were the average scores on each of these variables for each participant.

The dependent variable for this question was the Section 4 postmeasure average scores for each participant on behavioral intentions to teach counseling students about MHMAs, an interval level of measurement. The covariates entered for R1 were (a) generational category (dichotomous, categorical variable); (b) gender (dichotomous, categorical variable); (c) pre-study level of experience with MHMAs with four levels 0, 1, 2, or 3 (ordinal level of measurement); and (d) voluntariness of use score (interval level of measurement). Descriptive preliminary statistics, histograms, and scatter plots were used to evaluate for normal distribution of the independent and dependent interval-level variables. Assumption of linearity was assessed by examining bivariate scatter plots for all possible pairs of variables. Interactions between variables were assessed along with homogeneity of variance by the bivariate scatter plots. $R^2$ was used to determine effect size (Warner, 2013).

R2. The inferential statistic entered into SPSS was an independent samples $t$-test, a measure which is appropriate for determining differences between groups (the generational
category of digital immigrants and digital natives). The independent variable was generational category (dichotomous, categorical variable) with two levels: 0 = digital immigrant born before 1980 and 1 = digital native born after 1980. The dependent variable was the average number of health apps, an interval level of measurement, downloaded to personal phones of counselor educators. Descriptive preliminary histograms were used to determine if the outcome variable scores were approximately normally distributed. Variances were assessed with Levene’s Test to determine if the variances of the two populations differed significantly. Kurtosis and skewness were examined because outliers are threats to independent samples t-tests (Warner, 2013); 14 outliers were removed.

**R3.** The inferential statistic entered into SPSS was an independent samples t-test, a measure which is appropriate for determining differences between groups (the generational category of digital immigrants and digital natives). The independent variable was generational category (dichotomous, categorical variable) with two levels: 0 = digital immigrant born before 1980, and 1 = digital native born after 1980. The dependent variable was the average number of MHMAs, an interval level of measurement, downloaded to personal phones of counselor educators. Descriptive preliminary histograms were used to determine if the outcome variable scores were approximately normally distributed. Variances were assessed with Levene’s Test to determine if the variances of the two populations differed significantly. Kurtosis and skewness were examined because outliers are threats to independent samples t-tests (Warner, 2013); 14 outliers were removed.

**R4.** The inferential statistic entered into SPSS was ANCOVA, a measure which is appropriate for controlling for differences between groups based on covariates or extraneous variables. The independent variable entered into SPSS was generational category (dichotomous,
The dependent variable was the Section 4 postmeasure average behavioral intentions to teach MHMAs scores, an interval level of measurement. The covariates were (a) gender (dichotomous, categorical variable); (b) pre-study level of experience with MHMAs with four levels 0, 1, 2, or 3 (ordinal level of measurement); and (c) voluntariness of use score (interval level of measurement). Histograms, scatter plots, and preliminary ANOVA were used to evaluate for normality, homogeneity of variances (Levene’s test), and homogeneity of covariance with an intercorrelation matrix (Warner, 2013). $R^2$ was used to determine effect size (Warner, 2013).

**R5.** The inferential statistic entered into SPSS was ANCOVA, a measure which is appropriate for controlling for differences between groups based on covariates or extraneous variables. The independent variable entered into SPSS was generational category (dichotomous, categorical variable). The dependent variable was the Section 4 postmeasure average total values of MHMAs scores, an interval level of measurement. The covariates were (a) gender (dichotomous, categorical variable); (b) pre-study level of experience with MHMAs with four levels 0, 1, 2, or 3 (ordinal level of measurement); and (c) voluntariness of use score (interval level of measurement). Histograms, scatter plots, and preliminary ANOVA were used to evaluate for normality, homogeneity of variances (Levene’s test), and homogeneity of covariance with an intercorrelation matrix (Warner, 2013). $R^2$ was used to determine effect size (Warner, 2013).

**R6.** The inferential statistic entered into SPSS was ANCOVA, a measure which is appropriate for controlling for differences between groups based on covariates or extraneous variables. The independent variable was the level of online counselor education course offerings (categorical variable) with three levels: (0 = university offers no online courses in counselor education; 1 = university offers some online courses in counselor education; and 2 = the
university’s counseling degree may be obtained mainly through online course offerings. The dependent variable was the Section 4 postmeasure behavioral intentions to teach MHMAs scores, an interval level of measurement. The covariate data entered for R6 were (a) generational category (dichotomous, categorical variable); (b) gender (dichotomous, categorical variable); (c) pre-study level of experience with MHMAs with four levels 0, 1, 2, or 3 (ordinal level of measurement); and (d) voluntariness of use score (interval level of measurement). Histograms, scatter plots, and preliminary ANOVA were used to evaluate for normality, homogeneity of variances (Levene’s test), and homogeneity of covariance with an intercorrelation matrix (Warner, 2013). \( R^2 \) was used to determine effect size (Warner, 2013).

R7. The inferential statistic entered into SPSS was ANCOVA, a measure which is appropriate for controlling for differences between groups based on covariates or extraneous variables. The independent variable was the level of online counselor education course offerings (categorical variable) with three levels: (0 = university offers no online courses in counselor education; 1 = university offers some online courses in counselor education; and 2 = the university’s counseling degree may be obtained mainly through online course offerings. The dependent variable was the Section 4 postmeasure average total values of MHMAs scores, an interval level of measurement. The covariate data entered for R6 were (a) generational category (dichotomous, categorical variable); (b) gender (dichotomous, categorical variable); (c) pre-study level of experience with MHMAs with four levels 0, 1, 2, or 3 (ordinal level of measurement); and (d) voluntariness of use score (interval level of measurement). Histograms, scatter plots, and preliminary ANOVA were used to evaluate for normality, homogeneity of variances (Levene’s test), and homogeneity of covariance with an intercorrelation matrix (Warner, 2013). \( R^2 \) was used to determine effect size (Warner, 2013).
The inferential statistic used was a paired samples \( t \)-test to investigate the influence of trialability on counselor educators’ behavioral intentions to teach students about MHMAs. The independent variable was the premeasure Section 2 average scores on behavioral intentions to teach MHMAs, an interval level of measurement. The dependent variable was the postmeasure Section 4 average scores on behavioral intentions to teach MHMAs, an interval level of measurement. Descriptive statistics were used to evaluate for normality of differences between pairs.

The inferential statistic used was a paired samples \( t \)-test to investigate the influence of trialability on counselor educators’ total values of MHMAs scores. The independent variable was the premeasure Section 2 average scores on total values of MHMAs, an interval level of measurement. The dependent variable was the postmeasure Section 4 average scores on total values of MHMAs, an interval level of measurement. Descriptive statistics were used to evaluate for normality of differences between pairs.

**Qualitative Strand Research Questions**

Two broad research questions were used in the second phase of this sequential explanatory mixed methods design to investigate the central phenomenon of counselor educators’ values of and concerns about MHMAs as therapeutic counseling tools:

1. How do counselor educators perceive the value of MHMAs as therapeutic tools?
2. What are the concerns of counselor educators regarding the use of MHMAs as therapeutic tools?

A protocol of questions was used in the semistructured interviews to answer these two broad qualitative research questions.
Qualitative Strand Interviews, Counselor Educator Participants

A question on the quantitative instrument permitted educators to indicate willingness to participate or not in follow-up interviews. Potential interviewees were identified from the pool of educators who were willing to be interviewed and who met the qualitative inclusion criteria. The identified intention in the dissertation proposal was to interview 12 educators. The CACREP-accredited program requirement was dropped based on the need to expand the potential sample pool after the quantitative pilot study. Six groups were identified for obtaining the qualitative participants:

1. Digital immigrant (born prior to 1980) counseling educators from public university counseling programs (n =2).
2. Digital immigrant counseling educators from private university counseling programs (n =2).
3. Digital immigrant counseling educators from universities with online counseling programs (n =2).
4. Digital native (born after 1980) counseling educators from public university counseling programs (n =2).
5. Digital native counseling educators from private university counseling programs (n =2).
6. Digital native counseling educators from universities with online counseling programs (n =2).

Qualitative Strand Semistructured Interview Protocol

An introductory statement and predetermined protocol of questions was used in the online interviews with the counselor educators who were selected from the quantitative participant pool. Participants were permitted to deviate from the interview protocol and to freely
share relevant ideas, opinions, and concepts. Berg and Lune (2012) indicate that the flexibility of semistructured interview questions allows the interviewers to “pursue areas spontaneously initiated by the interviewee” (p. 114). Such deviation from the protocol permits the expression of deeper feelings, meanings, and concerns. The semistructured interview questions as presented in the dissertation proposal were modified after pilot testing the questions with two professors in Skype™ interviews, and then again after analyses of the quantitative data. The revised questions are presented in this section.

**Introduction shared with interviewees.** This study is on the topic of counselor education regarding mental health mobile apps, or MHMAs. MHMAs are an emerging technology. Mental health mobile apps exist on a variety of mental health topics including but not limited to cognitive behavior therapy, OCD, depression, anxiety, PTSD, sleep hygiene, weight loss, mood tracking, suicide prevention, and alcohol abuse. You will be asked to share your responses to a protocol of questions. Please feel free to share any additional thoughts that come to mind during the interview. This interview will be recorded, transcribed, and analyzed. As indicated in the questionnaire, the term counselor is intended to be inclusive and refers to mental health professionals such as counselors, social workers, marriage and family therapists, psychologists, and psychiatrists. Your identifying information will be kept confidential and anonymous. If you would rather not answer any question, please say so; that is not a problem. The interview should take about 30-45 minutes.

**Semistructured qualitative research questions for interviewees.**

1. 70% of counselor educators surveyed indicated a belief that MHMAs are relevant to counselor education and 80% indicated MHMAs are beneficial to clients when used as therapeutic tools by counselors who are effectively trained. Yet, more than 70% of counselor
educators surveyed in this study indicated no experience to very little experience with MHMAs, 80% had never taken a course on MHMAs, and only 3% had assigned a project to students related to MHMAs. How do you explain the difference between positive attitudes in general about MHMAs yet educators indicating very little experience with or instruction about MHMAs?

2. What formal training have you received in the use of MHMAs, such as professional development at your agency or institution, self-paced continuing education, or conference sessions?
   a. Please describe all the formal training you have received, your perceptions of the trainings, what you liked, and what you did not like.
   b. 80% of counselor educators surveyed indicated they have not attended any training through professional development or continuing education regarding MHMAs. Do you think there is a need for more formal training regarding mental health apps for faculty members in counseling-related academic programs?
   c. What are the best venues for offering training to the educators on this technology?
   d. Some educators mentioned an antitechnology sentiment in the counseling profession. What are your thoughts about why the counseling profession may be lagging behind other fields in technology adoption?

3. Please talk about your personal experience with uses of MHMAs for self-growth or self-help, such as apps for sleep, relaxation, professional burn-out, personal fitness, and mood tracking.

4. For this study, you examined only one evidence-based mental health app (PE Coach app). With thousands of mental health apps now available to consumers and counseling clients, what are your main concerns?
5. What are some of the main areas that should be included in training counselors to evaluate and use mental health apps?

6. If a counselor is considering recommending an MHMA to a client as a therapeutic tool, what criteria should that counselor use to evaluate that particular MHMA?

7. From technology acceptance theory, we know that voluntariness of use is a key indicator of actual use behavior of a technology. It appears most educators perceive that teaching counseling students about MHMAs is strictly voluntary. Voluntariness, therefore, may explain some of the lack of instruction. 97% of educators surveyed indicated a course on mental health technologies is not required. As digital tools such as MHMAs become more ubiquitous in our culture, what are your thoughts about counselor education programs and/or academic accrediting organizations such as APA, CACREP, and CSWE requiring academic programs to produce technologically competent mental health professionals who are trained to effectively evaluate and integrate the use of MHMAs?
   a. What type of accountability measures should be in place to promote and monitor technological competence?
   b. How are educators likely to react to being required to produce technologically competent counselors?

8. What would be effective methods for graduate-level counseling-related programs and faculty to use in preparing future counselors to use mental health mobile apps as therapeutic tools?
   a. A small percentage of educators indicated his or her program requires a course on mental health technologies. What are your thoughts about including a required course in graduate counseling programs on the topic of emerging digital technologies as therapeutic counseling tools?
b. As an alternative, do you think infusion of emerging mental health technologies across and within counselor training programs is a better approach?

c. If infusion of mental health technologies within and across courses is the method selected by a university counseling program, do you really think this will happen? Will professors across the board actually infuse mental health technologies into their curriculum?

d. If you were teaching a course in a graduate-level counseling program entitled Emerging Digital Technologies as Therapeutic Counseling Tools, what objectives and learning activities would you use?

9. Discuss the value of modeling the use of MHMAs to students. Discuss how you have or how you would consider modeling or demonstrating mental health apps to counseling students.

10. Some state licensing laws require continuing education on the topics of domestic violence and prevention of medical errors. In order to ensure licensed counselors are properly trained to evaluate, model, and use MHMAs as therapeutic tools, what are your thoughts on state licensing boards requiring continuing education on the topic of MHMAs as therapeutic counseling tools? Or, what are your thoughts on state licensing boards requiring continuing education on a more general topic of emerging technologies in the practice of counseling?

**Qualitative Strand Accuracy Method**

The transcriptions of interviews were sent to each participant to allow each professor the opportunity to check accuracy and trustworthiness of data (Berg & Lune, 2012). This process is known as member checking (Creswell, 2012). Only one of the 10 participants made minor modifications to her transcript. Including two strands of research and the perspectives of multiple individuals representing different generational categories, 10 different universities from regions
throughout the country, public universities, private universities, and universities with online counseling programs were methods of triangulating data. This method of triangulation contributed to validity and trustworthiness of the collected qualitative data (Creswell & Plano Clark, 2011). The final means of assessing qualitative data reliability and validity were two peer reviews of themes and codes (Berg & Lune, 2012). One peer reviewer is a practicing licensed mental health counselor with a master’s degree, and the other peer reviewer is a school counselor with a doctorate in education.

**Qualitative Strand Data Collection Method**

From the pool of participants in the quantitative strand, a point of interface in this mixed methods design (Creswell & Plano Clark, 2011), counselor educators were selected for the qualitative interviews. Within each of the six identified groups, potential participants were sent email invitations with the goal of having two interviewees in each group, for a total of 12. Potential interviewees were told that the first two people to respond by an identified date in each group would be interviewed. The potential pool of educators was four in category three and only two in category six. Ten educators agreed to be interviewed by the scheduled date, and because the universities closed for the holidays and the end of a grading period, no attempt was made to recruit the additional two participants. The interviews took place after participants completed the quantitative phase of the study.

Ten educators were interviewed via the Skype™ video chat feature and recorded. The video files were then converted to audio files in order to reduce file size for the file transfers to TranscribeMe!, a transcription service that uses voice recognition software to transcribe audio files. Interviews averaged 30 minutes, from start to finish. A total of just over five hours of data
were transcribed at a cost of $489.52: The $2.00-per-minute charge was reduced to $1.60-per-minute with a student discount.

**Qualitative Strand Data Analysis Method**

Transcriptions were sent to each interviewee for checking and approval. Modifications were noted by one participant and these changes were incorporated. I purchased QSR International’s NVivo 10 for Windows for the qualitative data analysis. I selected NVivo for its partnership with the TranscribeMe! service and because NVivo is well-established in qualitative research (Creswell, 2012). As themes emerged, related quotes were connected to the themes. Two independent coders also analyzed the qualitative interview data for consistency and provided written reports. The suggestions of these coders were incorporated into the content analysis. Themes are presented in tabular as well as narrative forms. To protect anonymity, participants were labelled as Dr. A, Dr. B, and so on through Dr. J. Participant descriptive information (generational category, gender, region of university, and level of experience with MHMAs) was transferred into NVivo from the data collected in the quantitative strand.

**Mixed Methods Research Questions**

Two mixed methods research questions were used to connect the quantitative strand research with the qualitative strand research:

1. Did the qualitative interview data explain the quantitative results about MHMAs? If so, how, and to what extent?

2. Did results emerge from comparing the quantitative survey data with the qualitative interview data on the topic of MHMAs in counselor education? If so, what results emerged by this comparison?
Mixed Methods Analysis Plan

Data from the quantitative strand were synthesized with interview data from the qualitative strand in the final mixed method analysis. The statistical results from each quantitative research question were compared with the qualitative findings by focusing particularly on the two mixed methods research questions. Data from the two research strands were integrated, and inferences were drawn. This synthesis is presented in the discussion chapter. Quotes from the interviews are used to highlight related quantitative findings. Meta-inferences are included regarding whether or not the qualitative data provided a better understanding of the problem than simply the quantitative results alone.

Summary of Method

This chapter provided an explanation of the approach to collecting and analyzing the data on the topic of MHMAs in counselor education. Described were the central research questions, the research design, and the specific research questions for the quantitative, qualitative, and mixed methods strands. The method for recruiting counselor educators as participants and the sampling methods were explained. Approaches for gaining permissions from the IRB, the universities, and the participants were outlined. The instruments used for data collection and the phases of data collection were explained. Attention now turns to the results of the study.
CHAPTER IV

RESULTS

The purpose of this study was to investigate counselor educators’ perceptions of mental health mobile apps (MHMAs) and the extent to which counselor education programs are training future mental health professionals to evaluate and integrate MHMAs into clinical practice. The results of the study are presented in this chapter. In keeping with the sequential explanatory mixed methods design used in this study, quantitative phase results are presented first, then the qualitative phase results. Participants are described within the results for each of the first two phases. Tables and figures are included for ease in understanding the data. The mixed methods analysis will be discussed in the final chapter.

Quantitative Strand Participant Demographics

For the quantitative survey, 2,699 counselor educators’ email addresses were entered into a database. The counselor educators were then sent emails inviting them to participate. This potential sample pool included counselor educators from academic programs that provide graduate degrees to mental health professionals such as counselors, marriage and family therapists, addictions counselors, school counselors, social workers, psychologists, and psychiatrists. Participants were asked to complete the survey by a certain date. The survey was discontinued at midnight on the target date with 132 responses, a 4.85% response rate. Descriptions of the participants are indicated in figures. The quantitative visuals were generated using SurveyMonkey™.

Eighty-eight professors indicated they taught in public universities (68.22%), and 43 indicated they taught in private universities (33.3%). The highest degrees earned by participants (Figure 15) were 112 with doctorate degrees (86.82%), one with a specialist degree (.78%), and
16 with master’s degrees (12.40%). Current academic titles of counselor educator participants in order from most to least in a category (Figure 16) were 59 assistant professors (45.74%), 27 adjunct professors/lecturers/instructors (20.93%), 25 associate professors (19.38%), and 18 professors (13.95%).

**Figure 15.** Highest degrees earned by counselor educator participants.

**Figure 16.** Current academic titles of counselor educator participants.
Nearly 80% of the participants had professional licenses (Figure 17). Forty-six were licensed mental health counselors or professional counselors (37.40%); 23 were licensed clinical social workers (18.70%); 21 were licensed clinical psychologists (17.07%); seven were licensed school counselors (5.69%); five were licensed marriage and family therapists (4.07%); three were licensed psychiatrists (2.44%); and the remaining 29 did not indicate any professional mental health related licenses (23.58%). Several participants held multiple licenses.

<table>
<thead>
<tr>
<th>Mental Health Related Licenses Held by Counselor Educator Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensed Psychiatrist (n=3)</td>
</tr>
<tr>
<td>Licensed Marriage &amp; Family Therapist (n=5)</td>
</tr>
<tr>
<td>Licensed School Counselor (n=7)</td>
</tr>
<tr>
<td>Licensed Clinical Psychologist (n=21)</td>
</tr>
<tr>
<td>Licensed Clinical Social Worker (LCSW) (n=23)</td>
</tr>
<tr>
<td>No License Held (n=29)</td>
</tr>
<tr>
<td>Licensed Mental Health Counselor (LMHC) (n=46)</td>
</tr>
</tbody>
</table>

*Figure 17.* Mental health related licenses held by counselor educator participants.

In terms of the number of years the participants had taught counselor education (Figure 18), 67 professors made up the largest group and had taught one to five years (51.94%); 22 professors had taught 7-15 years (17.05%); 17 professors had taught 6-10 years (13.18%); 15 professors had taught 16-20 years (11.63%); and eight professors had taught 21 or more years (6.20%).
Data were also collected on the highest degree level taught by the educators (Figure 19). The highest degree taught by 65 professors was master’s-degree-level students (50.39%); the highest degree taught by 56 professors was doctoral-degree-level students (43.41%); the highest degree taught by five professors was bachelor’s-degree-level students (3.88%); and the highest degree taught by three professors was specialist’s-degree-level students (2.33%).

Figure 19. Highest degree level taught by the counselor educators.
Educators were also asked to describe the level of online learning for their graduate counseling programs (Figure 20). Seventy-seven indicated that their universities offered some online courses for counselor education (59.69%); 36 indicated that their university offered no online courses for counselor education (27.91%); 15 indicated that their counseling program may be completed completely through online learning (11.63%); and one participant taught in a university that offers only online degrees (.78%).

<table>
<thead>
<tr>
<th>Level of Online Learning</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Offers NO Online Courses for Counselor Education (n=36)</td>
<td>27.91%</td>
</tr>
<tr>
<td>Fully Online University (n=1)</td>
<td>0.78%</td>
</tr>
<tr>
<td>COMPLETELY Online Counseling Program (n=15)</td>
<td>11.63%</td>
</tr>
<tr>
<td>University Offers SOME Online Courses (n=77)</td>
<td>59.69%</td>
</tr>
</tbody>
</table>

*Figure 20. Levels of online learning at participants’ universities.*

Universities where educators taught were located in each region of the United States (Figure 21). Thirty-seven professors taught at universities in the Midwest (28.68%); 34 taught at universities in the Southeast (26.36%); 28 taught at universities in the Northeast (21.71%); 20 taught at universities in the West (15.50%); 10 taught at universities in the Southwest (7.75%); and four taught in universities offering online programs (3.10%).
In terms of gender, 96 participants were female (74.42%) and 33 participants were male (25.58%). In terms of ethnicity, 119 participants identified themselves as not Hispanic or Latino and 10 participants identified themselves as Hispanic or Latino (7.75%). Regarding race (Figure 22), 106 participants identified themselves as White (82.17%), 11 identified themselves as Black or African-American; six identified themselves as from multiple races (4.65%); and four identified themselves as Asian (3.10%). No participants identified themselves as Native Hawaiian or other Pacific Islander. One potential participant withdrew from the study indicating the ethnicity and race categories did not reflect her.

**Figure 21.** Counselor educator participants’ universities by regions in the United States.
Figure 22. Race categories as indicated by participants.

Generational category is a theoretical lens for this study (Figure 23). Ninety counselor educators identified themselves as digital immigrants, born prior to 1980 (69.77%); 39 counselor educators identified themselves as digital natives born in 1980 or after (30.23%).

Figure 23. Generational category of counselor educator participants.
Data were also collected regarding smartphone devices and app use (Figure 24). Ninety-two counselor educators had Apple™ devices (71.32%), and 37 had Android devices™ (28.68%).

![Types of Smartphone Platforms used by Counselor Educators](image)

**Figure 24.** Types of smartphone platforms used by counselor educators.

Educators were asked how they first learned about MHMAs (Figure 25). Fifty learned through their own exploration of MHMAs (38.76%); 41 first learned about MHMAs through this dissertation research study (38.76%); 31 learned through professional conferences or continuing education (CE) classes (24.03%); 21 learned through their universities or colleagues (16.28%); seven learned about MHMAs from students (5.43%); and six learned from family or friends outside their universities (4.65%).

![How Counselor Educators First Learned about MHMAs](image)

**Figure 25.** How counselor educators first learned about MHMAs.
Only two of the participants indicated they are not users of mobile apps (1.55%), while 127 indicated they are users of mobile apps (98.45%). Regarding the number of health related apps on their phones (Figure 26), seventy participants indicated they had one to three (54.26%); 28 had four to six (21.71%); 18 had zero health apps (13.95%); eight had 11 or more health apps (6.20%); and five educators had seven to 10 health apps (3.88%). Regarding the number of MHMAs on counselor educators’ smartphones (Figure 26), 68 indicated no MHMAs on their phones (52.71%); 52 indicated one to three MHMAs (40.31%); eight indicated four to six MHMAs (6.20%); and one indicated they had seven to 10 MHMAs (.78%).

Figure 26. Number of health apps and MHMAs on counselor educator’s smartphones.

One of the moderating variables in this study was level of experience with using MHMAs. Figure 27 depicts the indicated levels of MHMAs experience. Fifty one educators reported no experience with using MHMAs (39.53%); 43 reported low experience (33.33%); 26
reported moderate experience (20.16%); eight reported high experience (6.20%), and one reported very high experience with MHMAs (.78%).

**Figure 27.** Participants’ levels of experience with MHMAs.

In the past three years, 104 educators had received no training on the topic of MHMAs (80.62%); 25 had attended one to three training courses on MHMAs (19.38%) (Figure 28). Only three educators (2.33%) indicated that they had previously participated in any other MHMAs research.

**Figure 28.** Number of trainings attended by participants regarding MHMAs in past three years.
Educators were asked to indicate in how many of the courses he or she taught in the past year were MHMAs included in the curriculum (Figure 29). Ninety-one educators indicated that they had not covered this topic in any courses (70.54%); 30 indicated they covered the topic of MHMAs in one to two courses (23.26%); five covered the topic in three to four courses (3.88%); and three indicated that this question did not apply to them (2.33%). Only four (3.10%) educators had assigned students a research project or assignment on MHMAs (Figure 29).

Figure 29. MHMAs in counselor education courses.

Only two educators indicated that their counseling program required a course on the topic of mental health technologies (Figure 30). As opposed to a required course on mental health technologies, educators were asked to indicate the degree to which they agreed with the statement “our counselor education program infuses education about mental health technologies within and across courses” (Figure 30). Twenty-four educators strongly disagreed (18.60%); 57 disagreed (44.19%); 34 were undecided (26.36%); 13 agreed that infusion was occurring
(10.08%), and one educator strongly agreed that infusion of mental health technologies was occurring in his or her counselor education program (.78%).

Figure 30. Required mental health technologies course versus infusion.

Quantitative Strand Data Analysis Results

Scale reliability. Although scale analysis of the MHMAs in Counselor Education Questionnaire (Appendix C) was conducted in the pilot study, it was with a relatively small sample size. Therefore, after checking for normality and deleting 14 outliers, scale analysis was conducted with the participant data (N = 118). The internal consistency scores indicated the need to drop question three from the effort expectancy scale “downloading MHMAs is easy for most users of mobile phones or tablets.” For the facilitating conditions scale, the internal consistency scores also indicated the need to drop question one, “my university has a dependable high speed Internet connection” and question two, “my university’s technical support team is reliable.” For
the voluntariness of use scale, the internal consistency scores indicated the need to drop question three, “teaching counseling students to use MHMAs is strictly voluntary in our counselor education program.” These four questions were not deleted from the instrument in Appendix C. Data collected from these questions, however, were not included in the final analyses of the research questions. Cronbach’s alpha scores are shown in Table 2. The total values of MHMAs scores reflects the combined scores of three scales: performance expectancy/relevance, effort expectancy, and attitudes. The final total instrument reliability for all combined scales with 38 questions was .927.

Table 2

MHMAs in Counselor Education Post-Measure Section 4: Comparison of Cronbach’s Alphas

<table>
<thead>
<tr>
<th>Scale</th>
<th>Prior to Removing Q from EE, FC, &amp; VU</th>
<th>AFTER dropping Q from EE, FC, &amp; VU</th>
<th>Final No. of Scale Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy/Relevance</td>
<td>.898</td>
<td>.898</td>
<td>12</td>
</tr>
<tr>
<td>Effort Expectancy</td>
<td>.634</td>
<td>.887</td>
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<td>Attitude</td>
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<td>.827</td>
<td>6</td>
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<tr>
<td>Social Influence</td>
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<td>.853</td>
<td>3</td>
</tr>
<tr>
<td>Facilitating Conditions</td>
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<td>.714</td>
<td>2</td>
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<tr>
<td>Anxiety/Apprehension</td>
<td>.826</td>
<td>.826</td>
<td>3</td>
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<tr>
<td>Behavioral Intentions To Teach Students About MHMAs</td>
<td>.842</td>
<td>.842</td>
<td>5</td>
</tr>
<tr>
<td>Voluntariness of Use</td>
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<td>.720</td>
<td>2</td>
</tr>
<tr>
<td>Ethical Concerns</td>
<td>.954</td>
<td>.954</td>
<td>3</td>
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<tr>
<td>TOTAL Instrument Reliability All Above Scales Combined</td>
<td>.919</td>
<td>.927</td>
<td>38</td>
</tr>
<tr>
<td>*Total Values of MHMAs (PE + EE + Attitude)</td>
<td>.922</td>
<td>.925</td>
<td>20</td>
</tr>
</tbody>
</table>

*The Total Values of MHMAs scores are the combined Performance Expectancy-Relevance, Effort Expectancy, and Attitude scales
Results of R1. Using instructions provided by University of Colorado (“Hierarchical”, n.d.), Cunningham and Aldrich (2012), and Warner (2013) a hierarchical multiple regression was performed to predict scores on counselor educators’ behavioral intentions to teach counseling students about MHMAs using the postmeasure Section 4 scores for the following variables: generational category (coded 1 = digital native, 2 = digital immigrant); gender (coded 1 = male, 2 = female); pre-study level of experience with MHMAs (coded 0 = no experience, 1 = low experience, 2 = moderate experience, 3 = high experience, and 4 = very high experience); voluntariness of use; performance expectancy/relevance; effort expectancy; attitudes; social influence; facilitating conditions; apprehension/anxiety; and ethical concerns. The total N for this sample was 132. After dropping incomplete surveys, those with response sets of the same response throughout, and 14 outliers for this analysis, the number included was N = 104. Preliminary data screening included examination of histograms, scatter plots, P-P plots, and examination of skewness and kurtosis. Although visual inspection of the P-P Plots indicated scores close to the line, there was evidence of negative skewness on four of the independent variable scales (effort expectancy = -1.141, social influence = -.145, facilitating conditions = -.311, anxiety-apprehension = -.564). The dependent variable postmeasure behavioral intentions to teach scale was also negatively skewed (-.596). The nonparametric Kolmogorov-Smirnov test was run to further check the data distributions for normalcy. This test indicated that only the performance expectancy/relevance scale was normally distributed. Just prior to completing postmeasure Section 4, however, educators had interacted with an evidence-based mental health app. Scores were therefore expected to move toward the higher end of scale axes, indicating positive changes about MHMAs after interacting with the evidence-based MHMA. In addition, the participants in this study were very similar in technology adoption. One criterion for
inclusion in the study was ownership of a smartphone. This fact combined with the fact that all participants were educators in similar types of academic programs contributed to similarity in scores. I ran the hierarchical multiple regression analysis with this background and caution in mind.

A four-stage model hierarchical multiple regression was performed with average behavioral intentions to teach students about MHMAs as the dependent variable; that is, each predictor variable was entered in an order that was determined based on the UTAUT (Venkatesh et al., 2003). The order was Model 1: gender, age category, level of MHMAs experience, and voluntariness of use (variables identified by UTAUT as moderating influencers); Model 2: performance expectancy/relevance, effort expectancy, and attitude; Model 3: facilitating conditions and social influence; and Model 4: anxiety/apprehension and ethical concerns. A summary of the regression analysis is reported in Table 3. Means and standard deviations for the variables are reported in Table 4.

The hierarchical multiple regression revealed that, at stage one (Model 1), level of experience and voluntariness of use contributed significantly to the regression model, $F(4, 93) = 4.546, p < .01$ and, combined with age and gender, accounted for 12.8% (adjusted $R^2$) of the variance in behavioral intentions to teach students about MHMAs. Introducing performance expectancy/relevance, effort expectancy, and attitudes in Model 2 explained 34.5% of the variation in behavioral intentions to teach students about MHMAs, and this change in $R^2$ was significant, $F(7, 90) = 8.286, p < .001$. Adding facilitating conditions and social influence in Model 3 explained 40.3% of the variation in behavioral intentions to teach students about MHMAs, and this change in $R^2$ was also significant $F(9, 88) = 8.288, p < .001$. Finally, the addition of anxiety/apprehension and ethical concerns (Model 4) to the hierarchical regression
explained 44.8% of the variation in behavioral intentions to teach, and this change in $R^2$ was also significant $F(11, 86) = 8.145, p < .001$. When comparing each variable independently to the dependent variable, the most important predictors were attitude (.567), performance expectancy/relevance (.555), social influence (.456), and anxiety/apprehension (.441). When all 11 independent variables were included in Model 4, the only significant predictors of behavioral intentions to teach were social influence, anxiety/apprehension, and ethical concerns. Together, the 11 variables accounted for 51% ($R^2$) of the variance in behavioral intentions to teach students about MHMAs. The decision was made to reject the null hypothesis that indicated that there were no relationships between the independent variables and the average behavioral intentions to teach students about MHMAs when considering the moderating influences of gender, age, level of experience, and voluntariness of use.
Table 3

Summary of Hierarchical Multiple Regression Analysis for Variables Predicting Behavioral Intentions to Teach Counseling Students about MHMAs

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>T</th>
<th>$sr^2$</th>
<th>R</th>
<th>$R^2$</th>
<th>Adj $R^2$</th>
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<tr>
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<tr>
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<tr>
<td>Ethics Concerns</td>
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<td></td>
</tr>
</tbody>
</table>

Note. N = 104

*p < .05. **p < .01

NOTE: Predictors were entered by groups in four steps:

Model 1: gender, age category, level of MHMAs experience, and voluntariness of use (variables identified by UTAUT as moderating influencers)

Model 2: performance expectancy/relevance, effort expectancy, and attitude

Model 3: facilitating conditions and social influence

Model 4: anxiety/apprehension and ethical concerns
Table 4

Means and Standard Deviations for $R_1$ Variables

<table>
<thead>
<tr>
<th>Beh Int</th>
<th>Gender</th>
<th>Age Categ</th>
<th>Exp Level</th>
<th>Vol Use</th>
<th>PE Relev</th>
<th>Effort Exp</th>
<th>Attitude</th>
<th>Fac Cond</th>
<th>Soc Infl</th>
<th>Anxiety Appreh</th>
<th>Ethical Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.39</td>
<td>__a</td>
<td>__b</td>
<td>.93</td>
<td>2.58</td>
<td>3.87</td>
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<td>3.76</td>
<td>3.20</td>
<td>2.50</td>
<td>3.65</td>
</tr>
<tr>
<td>SD</td>
<td>.68</td>
<td>__c</td>
<td>__d</td>
<td>.89</td>
<td>.76</td>
<td>.44</td>
<td>.58</td>
<td>.46</td>
<td>.84</td>
<td>.74</td>
<td>.73</td>
</tr>
</tbody>
</table>

a Because gender was a dummy variable, mean was not reported.
b Because age category was a dummy variable, mean was not reported.
c Because gender was a dummy variable, SD was not reported.
d Because age category was a dummy variable, SD was not reported.

Results of $R_2$. An independent samples $t$ test (Cunningham & Aldrich, 2012; Warner, 2013) was performed to assess whether the mean number of health apps ($0 = \text{no health apps}; 1 = 1-3 \text{ health apps}; 2 = 4-6 \text{ health apps}; 3 = 7-10 \text{ health apps}; \text{and } 4 = 11 \text{ or more health apps}$) downloaded to the phones of counselor educators differed significantly for a group of 72 digital immigrant counselor educators born prior to 1980 and a group of 35 digital native counselor educators born in 1980 or after. The mean score for digital natives was ($M = 1.34, SD = .998$), meaning participants had an average of slightly more than three health apps on their phones. The mean score for digital immigrants was slightly higher, ($M = 1.39, SD = .987$), indicating this group also had an average of slightly more than three health apps. The mean difference between the two generational categories was -.046. Preliminary data screening indicated that scores on the number of health apps downloaded to smartphones was positively skewed; scores gravitated toward the lower end of the scale axes, indicating that educators were similar in having lower numbers of health apps on their smartphones. The assumption of homogeneity of variance was assessed with the Levene’s test, $F = .030, p = .863$; this test indicated no significant violation of the equal variance assumption. Therefore, the pooled variance version of the $t$ test was used. The
mean number of health apps on the smartphones of the educators did not significantly differ between the digital immigrants and the digital natives, $t(105) = -.226, p = .882$, two tailed. Since the distribution of scores did not meet the requirements for normality, the nonparametric Mann-Whitney U Test was also conducted. This test statistic also indicated no significant difference between the digital immigrants and digital natives in terms of health apps downloaded to personal smartphones. Based on this analysis, the decision was made not to reject the null hypothesis.

**Results of R3.** An independent samples $t$ test (Cunningham & Aldrich, 2012; Warner, 2013) was performed to assess whether the mean number of MHMAs ($0 = \text{no MHMAs}; 1 = 1-3 \text{MHMAs}; 2 = 4-6 \text{MHMAs}; 3 = 7-10 \text{MHMAs};$ and $4 = 11 \text{or more MHMAs}$) downloaded to the phones of counselor educators differed significantly for a group of 72 digital immigrant counselor educators born prior to 1980 and a group of 35 digital native counselor educators born in 1980 or after. The mean score for digital natives was ($M = .69, SD = .758$), meaning on average they had less than one mental health mobile app on their phones. The mean score for digital immigrants was slightly lower ($M = .47, SD = .581$) indicating on average this group also had slightly less than one mental health mobile app on their smartphones. The mean difference between the two generational categories was .213. Preliminary data screening indicated that scores on number of MHMAs downloaded to smartphones was positively skewed; scores gravitated close to the lower end of the scale axes, indicating that educators were similar in having low numbers of MHMAs on their smartphones. The distribution was also leptokurtic. The assumption of homogeneity of variance was assessed by the Levene’s test, $F = 2.206, p = .140$; this measure indicated no significant violation of the equal variance assumption; therefore the pooled variance version of the $t$ test was used. The mean number of MHMAs on the smartphones
of the educators did not significantly differ between the digital immigrants and the digital natives, $t (105) = 1.610, p = .110$, two tailed. Since the distribution of scores did not meet the requirements for normality, the nonparametric test Mann-Whitney U Test was also conducted. This test statistic also indicated no significant difference between the digital immigrants and the digital natives in terms of MHMAs downloaded to personal smartphones. Based on this analysis, the decision was made not to reject the null hypothesis.

Results of R4. An ANCOVA statistical analysis was conducted to determine if there were differences between a group of digital native counselor educators ($n = 35$) and a group of digital immigrant counselor educators ($n = 72$) regarding behavioral intentions to teach students about MHMAs ($Y$) when controlling for the influences of gender, pre-study level of experience with MHMAs, and voluntariness of use. Scores on the behavioral intentions to teach scale items were: 1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; and 5 = strongly agree.

Preliminary data screening indicated that scores on $Y$ were not normally distributed and were negatively skewed, meaning the scores gravitated toward the positive side of the behavioral intentions to teach students about MHMAs axis. A main assumption for ANCOVA was not met. In the absence of a nonparametric statistical test to use in place of ANCOVA, however, the ANCOVA test was conducted as it is a robust test. The results, however, are to be interpreted with caution.

The mean score for digital natives was ($M = 3.39, SD = .726$), meaning the total average scores were slightly over being undecided about behavioral intentions to teach students about MHMAs. The mean score for digital immigrants was ($M = 3.38, SD = .67$), very similar to the scores of digital natives. The assumption of homogeneity of variance was assessed with the Levene’s test, $F = .110, p = .741$; this measure indicated no significant violation of the equal
variance assumption. Based on the ANCOVA, two of the covariates were significantly related to behavioral intentions to teach students about MHMAs. Results indicated that level of experience influenced behavioral intentions, $F(1,102) = 13.503, p < .001$. Results also indicated voluntariness of use influenced behavioral intentions $F(1,102) = 6.310, p < .05$. The main effect for age category using the covariates of gender, level of MHMAs experience, and voluntariness of use, however, was not statistically significant: $F(1, 102) = .423, p = .517$. The strength of the association between age category and behavioral intentions to teach MHMAs when considering the influences of the covariates was 19.5% ($R^2$). Based on this ANCOVA analysis, the decision was made not to reject the null hypothesis for $R_4$.

Results of Rs. An ANCOVA statistical analysis was conducted to determine if there were differences between a group of digital native counselor educators ($N = 35$) and a group of digital immigrant counselor educators ($N = 72$) regarding average total values of MHMAs ($Y$) when controlling for the influences of gender, pre-study level of experience with MHMAs, and voluntariness of use. The total values of MHMAs scales was the combined average scores of three scales in the MHMAs in Counselor Education Questionnaire: the performance expectancy/relevance scale, the effort expectancy scale, and the attitudes about MHMAs scale. Participants scored items as 1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; and 5 = strongly agree. Preliminary data screening indicated scores on $Y$ were normally distributed.

The mean score for digital natives was ($M = 3.88, SD = .382$), meaning the total average scores were close to a four on the 1-5 scale, indicating that digital native educators have positive perceptions about the value of MHMAs. The mean score for digital immigrants was ($M = 3.79, SD = .422$), slightly lower but very similar to the scores of digital natives. The assumption of homogeneity of variance was assessed with the Levene’s test, $F = 1.949, p = .166$; this measure
indicated no significant violation of the equal variance assumption. Based on the ANCOVA, two of the covariates were significantly related to total values of MHMAs. Results indicated level of experience influenced total values of MHMAs, $F(1,102) = 5.083, p < .05$. Results also indicated voluntariness of use influenced total values of MHMAs $F(1,102) = 12.821, p < .01$. The main effect for age category using the covariates of gender, level of MHMAs experience, and voluntariness of use, however, was not statistically significant: $F(1, 102) = .200, p = .656$. The strength of the association between age category and total values of MHMAs when considering the influences of the covariates was 21.9% ($R^2$). Based on this analysis, the decision was made not to reject the null hypothesis for $R_5$.

**Results of $R_6$.** An ANCOVA statistical analysis was conducted to determine if there were differences between the level of online course offerings for counselor education programs (1 = university offers no online courses in counselor education; 2 = university offers some online courses in counselor education; and 3 = the university’s counseling degree may be obtained mainly through online learning; and 4 = all degrees offered by the university are completely online) and average behavioral intentions to teach counseling students about MHMAs ($Y$) when controlling for the influences of gender, prestudy level of experience with MHMAs, and voluntariness of use. The sample size of counselor educators was $N = 107$. Preliminary data screening indicated that scores on $Y$ were not normally distributed. A main assumption for ANCOVA was not met. In the absence of a nonparametric statistical test to use in place of ANCOVA, however, the ANCOVA test was conducted as it is a robust test. The results, however, are to be interpreted with caution.

The mean score for level of online learning was ($M = 1.833, SD = .60$), meaning the total average scores were close to a two on the 1-4 scale, indicating that educators on average teach in
universities that have some online courses in counselor education programs. Thirty \((N = 30)\) educators teach in universities with no online counselor education courses offered. Sixty-five \((n = 65)\) teach in universities offering some online courses in counselor education. Twelve \((n = 12)\) teach in universities that offer completely online counseling programs. None of the educators included in the analysis for this research question taught in fully online universities. The mean score for behavioral intentions to teach students about MHMAs was \((M = 3.38, SD = .684)\). On the Likert scale range of scores from 1-5, the 3.38 indicates scores nearly half-way between undecided and agreement with behavioral intentions to teach students about MHMAs. The assumption of homogeneity of variance was assessed with the Levene’s test, \(F = .395, p = .675\); this measure indicated no significant violation of the equal variance assumption. As in the ANCOVA tests for the prior research questions, two of the covariates were significantly related to behavioral intentions to teach students about MHMAs. Results indicated level of experience influenced behavioral intentions to teach MHMAs \(F (1,102) = 13.390, p < .001\). Results also indicated that voluntariness of use influenced behavioral intentions to teach MHMAs \(F (1,101) = 5.984, p < .05\). The main effect for level of online course offerings using the covariates of gender, level of MHMAs experience, and voluntariness of use, however, was not statistically significant, \(F (2, 101) = .625, p = .537\). The strength of the association between level of online learning offerings and behavioral intentions to teach MHMAs when considering the influences of the covariates was 20.1\% \((R^2)\). Based on this analysis, the decision was made not to reject the null hypothesis for R₆.

**Results of R₇.** An ANCOVA statistical analysis was conducted to determine if there were differences between the level of online course offerings for counselor education programs \((1 = university offers no online courses in counselor education; 2 = university offers some online
courses in counselor education; and 3 = the university’s counseling degree may be obtained mainly through online learning; and 4 = all degrees offered by the university are completely online) and average total values of MHMAs ($Y$) when controlling for the influences of gender, pre-study level of experience with MHMAs, and voluntariness of use. The total values of MHMAs scale was comprised of the combined average scores on three scales from the MHMAs in Counselor Education Questionnaire: the performance expectancy/relevance scale, the effort expectancy scale, and the attitudes about MHMAs scale. Scores on the total values of MHMAs scale items were 1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; and 5 = strongly agree. Preliminary data screening indicated that scores on $Y$ were normally distributed. The sample size of counselor educators was $N = 107$.

The mean score for level of online learning was ($M = 1.833, \ SD = .60$), meaning the total average scores were close to a two on the 1-4 scale, indicating that educators on average teach in universities that have some online courses in counselor education programs. Thirty ($n = 30$) educators teach in universities with no online counselor education courses offered. Sixty-five ($n = 65$) teach in universities offering some online courses in counselor education. Twelve ($n = 12$) teach in universities that offer completely online counseling programs. None of the educators included in the analysis of this research question teach in fully online universities. The mean score for total average values of MHMAs was ($M = 3.82, \ SD = .409$).

The assumption of homogeneity of variance was assessed with the Levene’s test, $F = 1.458, \ p = .237$; this measure indicated no significant violation of the equal variance assumption. As in the ANCOVA tests for the prior research questions, two of the covariates were significantly related to average total values of MHMAs. Results indicated that level of experience influenced average total values of MHMAs $F (1,101) = 5.324, \ p < .05$. Results also
indicated that voluntariness of use influenced total values of MHMAs $F (1,101) = 12.762$, $p < .01$. The main effect for level of online course offerings using the covariates of gender, level of MHMAs experience, and voluntariness of use, however, was not statistically significant: $F (2, 101) = .083, p = .921$. The strength of the association between level of online learning offerings and total values of MHMAs when considering the influences of the covariates was 21.9% ($R^2$). Based on this analysis, the decision was made not to reject the null hypothesis.

**Results of Rs.** A paired samples $t$ test was run to determine the influence of trialability on 107 counselor educators’ behavioral intentions to teach students about MHMAs. Average behavioral intentions to teach counseling students about MHMAs scores were used from the pretest measure (Section 2) of the MHMAs in Counselor Education Questionnaire for variable one. Average behavioral intentions to teach counseling students about MHMAs scores were used from the postmeasure (Section 4) of the same instrument for variable two. The pretest behavioral intentions to teach scores were normally distributed ($M = 3.295, SD = .643$); however, the postmeasure behavioral intentions to teach scores were negatively skewed, meaning scores gravitated toward the positive side of the scale ($M = 3.39, SD = .684$). This result was to be expected, however, because of the similarities between the participants and because of the intervention of interaction with the evidence-based PE Coach app.

Paired samples correlations indicated a significant correlation (.793) between the pretest and postmeasure scores $p < .001$. The results of the paired samples $t$ test was $t (106) = -2.166, p < .05$. The means of the two scores and the direction of the $t$-value indicated a statistically significant increase in behavioral intentions to teach students about MHMAs following interaction with and evaluation of the PE Coach app for use with prolonged exposure therapy in the treatment of PTSD. The improvement in scores went from
3.295 ± .643 to 3.385 ± .6839 (p < .05); an improvement of .09 ± .4285. The decision was made to reject the null hypothesis for R₈ which stated there would be no difference between pre- and postmeasure scores on behavioral intentions to teach students about MHMAs after interaction with the PE Coach app.

**Results of R₉.** A paired samples t test was run to determine the influence of trialability on 107 counselor educators’ average total values of MHMAs scores. Average total values of MHMAs scores were used from the pretest measure (Section 2) of the MHMAs in Counselor Education Questionnaire for variable one. Average total values of MHMAs scores were used from the postmeasure (Section 4) of the same instrument for variable two. The total values of MHMAs scales was the average score of three scales in the MHMAs in Counselor Education Questionnaire, the performance expectancy/relevance scale, the effort expectancy scale, and the attitudes about MHMAs scale. The pretest average total values of MHMAs scores were normally distributed (M = 3.637, SD = .417). The postmeasure average total values of MHMAs scores were also normally distributed (M = 3.82, SD = .409).

Paired samples correlations indicated a significant correlation (.672) between the pretest and postmeasure scores (p < .001). The results of the paired samples t test was $t (106) = -5.757$, $p < .001$. The means of the two scores and the direction of the t-value indicated a statistically significant increase in average total values of MHMAs scores following interaction with and evaluation of the PE Coach app for use with prolonged exposure therapy in the treatment of PTSD. The improvement in scores went from 3.637 ± .4165 to 3.823 ± .4094 (p < .001); an improvement of .1861 ± .3343. The decision was made to reject the null hypothesis for R₉ which stated there would be no difference between pre-
and postmeasure scores on average total values of MHMAs after interaction with the PE Coach app.

**Qualitative Strand Participant Demographics**

Ten counselor educators representing 10 different universities from across the United States participated in the Skype interviews. From public universities were two digital immigrants and two digital natives; from private universities were two digital immigrants and two digital natives; and, from universities with online counseling programs were one digital immigrant and one digital native. Every region in the United States (U.S.) was represented: Northeast \( n = 3 \); Midwest \( n = 2 \); West \( n = 2 \); Southeast \( n = 1 \); Southwest \( n = 1 \); and one completely online university drawing students from all regions \( n = 1 \).

Regarding gender, nine females and one male professor participated. Eight females held doctorate degrees, and one female held a master’s degree. The male had a doctorate degree. Eight identified themselves as White (80%), and two identified themselves as Black or African-American (20%). Nine identified themselves as Not Hispanic or Latino (90%), and one identified herself as Hispanic or Latino (10%).

**Qualitative Strand Themes**

The qualitative question protocol was predetermined based on the theoretical foundation of technology acceptance and use and based on the literature review. Questions were modified based on the quantitative data analysis in order to clear up discrepancies and shed more light on the central phenomena, counselor educators’ concerns about and values of MHMAs. By determining a protocol in advance and guiding the interviews with these questions, most major themes were predetermined. Many of the themes and subthemes are interrelated. The antitechnology sentiment, for example, appeared to be related to generational differences and
also to a profession that values face-to-face human connection. Interest sparked by this dissertation study was an additional theme that emerged from the interviews. Table 5 offers a summary of the themes and subthemes.
Table 5

Results of Qualitative Theme Analysis for MHMAs in Counselor Education

<table>
<thead>
<tr>
<th>Themes and Subthemes</th>
<th>Total # References in Major Theme</th>
<th>References</th>
<th>Sources</th>
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</thead>
<tbody>
<tr>
<td><strong>Disparity-Valuing MHMAs but Not Teaching MHMAs</strong></td>
<td></td>
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<tr>
<td>Antitechnology Sentiment in Counseling Field</td>
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<tr>
<td>Generational Differences</td>
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<td>19</td>
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<tr>
<td>Lack of Awareness-Technology &amp; MHMAs Emerged Faster than Training</td>
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<tr>
<td>Differences in Approach: F2F vs Online</td>
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<tr>
<td>Too Busy to Learn About MHMAs</td>
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<tr>
<td>Avoidance of Devoting Time to Changing A Course</td>
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<tr>
<td>Fear of Loss of Control &amp; Being Replaced.</td>
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<td>1</td>
</tr>
<tr>
<td>Frightened Away by Ethical Codes</td>
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<tr>
<td>Organizational Technology Adoption Shift Takes Time</td>
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<tr>
<td><strong>Concerns about MHMAs</strong></td>
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<tr>
<td>Counseling Replacement Instead of Supplement</td>
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<tr>
<td>Quality Control Concerns</td>
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<td>Contributing to Lack of Human Social Interaction</td>
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<td>Fear of Self-Diagnosis &amp; Treatment Attempts</td>
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<td>Liability Concerns</td>
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<td>Privacy &amp; Confidentiality Concerns</td>
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<td><strong>Benefits of MHMAs to Counseling</strong></td>
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<td>Personal Use of Apps by Educators</td>
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<td><strong>MHMAs’ Training for Educators</strong></td>
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<td>Training Needed for Educators about MHMAs</td>
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<td>Training Venues</td>
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<td>Price Value of Training Course</td>
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<td>Training Purpose for Educators</td>
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<td>Educator Training-Benefits of MHMAs</td>
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<tr>
<td>Educator Training-How to Incorporate MHMAs into Curriculum</td>
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<tr>
<td>Educator Training-Increase Awareness of MHMAs</td>
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<td><strong>Voluntary vs Involuntary Training Debate</strong></td>
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<td>Views about Licensing Boards Requiring Training</td>
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<tr>
<td>Should Tech Course Be Required by Ethics Codes &amp; Accrediting Boards</td>
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<td><strong>Teaching Students about MHMAs</strong></td>
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<td>Controversy: Infusion vs Required Course</td>
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<td>Favors Infusion of Technology Within &amp; Across Courses</td>
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<td>Opinions about Requiring Emerging Technology Course</td>
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<tr>
<td>Overwhelmed in Required Courses</td>
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<tr>
<td>Overwhelmed Educators in Counselor Education Programs</td>
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<tr>
<td>Teaching Methods</td>
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<tr>
<td>Demonstrate Competency in MHMAs Use</td>
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<td>15</td>
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<tr>
<td>Modeling Benefits</td>
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<td>Objectives &amp; Learning Goals</td>
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<tr>
<td>Concurrent Professional Development With MHMAs Training</td>
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<tr>
<td>How to Evaluate &amp; Determine Efficacy of MHMAs</td>
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<tr>
<td>How to Integrate MHMAs with Therapy</td>
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<td>Need for Technology Resources &amp; Support</td>
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<td><strong>Integrating MHMAs with Therapy</strong></td>
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<td>Determine Relevance, Benefits, &amp; Quality</td>
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<td>Alignment of MHMAs with Clients Issues</td>
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<td>Ease of Use</td>
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<tr>
<td>Determine Empirical and Evidence Based Foundation</td>
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<td>Develop Competency in Use of MHMAs</td>
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<td>Evaluate Endorsements</td>
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<td>Importance of Reinforcements and Reminders</td>
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<td>Monitor Progress and Treatment Outcomes</td>
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<td>Assess Client Reading Level re Therapy Jargon in MHMAs</td>
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<td>Avoid Diagnostic MHMAs</td>
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<tr>
<td>Determine Risks of MHMAs</td>
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<tr>
<td><strong>Interest Sparked by This Research</strong></td>
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</tbody>
</table>
To protect anonymity, pseudonyms were assigned for participants, Dr. A., Dr. B., . . . and Dr. J. In order to shed light on their comments, Table 6 offers the basic demographics used for the inclusion criteria.

Table 6

Qualitative Participants’ Pseudonyms with Generational Category and University Type

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Generational Category</th>
<th>University Type: Public, Private, Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. A</td>
<td>Digital Immigrant</td>
<td>Public</td>
</tr>
<tr>
<td>Dr. B</td>
<td>Digital Immigrant</td>
<td>Public</td>
</tr>
<tr>
<td>Dr. C</td>
<td>Digital Immigrant</td>
<td>Private</td>
</tr>
<tr>
<td>Dr. D</td>
<td>Digital Immigrant</td>
<td>Private</td>
</tr>
<tr>
<td>Dr. E</td>
<td>Digital Immigrant</td>
<td>Online</td>
</tr>
<tr>
<td>Dr. F</td>
<td>Digital Native</td>
<td>Public</td>
</tr>
<tr>
<td>Dr. G</td>
<td>Digital Native</td>
<td>Public</td>
</tr>
<tr>
<td>Dr. H</td>
<td>Digital Native</td>
<td>Private</td>
</tr>
<tr>
<td>Dr. I</td>
<td>Digital Native</td>
<td>Private</td>
</tr>
<tr>
<td>Dr. J</td>
<td>Digital Native</td>
<td>Online</td>
</tr>
</tbody>
</table>

Disparity between valuing MHMAs and not teaching students about MHMAs.

From the quantitative analysis, it was found that more than 75% of educators had little to no experience with MHMAs or training about MHMAs, yet scores on behavioral intentions to teach students gravitated toward the positive end of the scale. Also, in the evaluation of the PE Coach app, participants were permitted to make written comments. Many of these comments expressed positivity about that particular app as well as comments about the benefits of MHMAs in
Educators were asked to clarify this disparity and in so doing, several subthemes emerged.

**Antitechnology sentiment in the counseling field.** Twenty-five references were made to an antitechnology sentiment in the counseling field. Dr. A (personal communication, December 15, 2014), a digital immigrant, expressed tension between professors regarding technology. Her comments connected the antitechnology sentiment to generational differences as well as to the face-to-face mentality in the counseling field:

> On my part, it's because even though I use a lot of technology, some of the faculty that I work with are very antitechnology, and it becomes almost a really bad power struggle when I try to use new things in my classes. I do it, but it's not always the best experience for me in faculty meetings when I do . . . Part of it, I think, is because it's the idea that we can't possibly do what we do using any type of technology because it takes out the personal aspect, which isn't true, but that's what I'm being told when I try. I teach hybrid courses all the time, and I've proven through data that my students in the hybrid classes learn more and dig deeper than the students in the face-to-face classes, but it doesn’t matter. In my department I will never teach an online course because they will never allow us to have one, and it's not worth the fight with the other faculty members. So I think there's this old school mentality that we have to do everything face-to-face, and that students can't possibly learn online. We're way behind . . . this field is just not as interested [chuckles] in technology as we should be. We're just not. (Dr. A, personal communication, December 15, 2014)

Dr. B (personal communication, December 16, 2014), a digital immigrant, captured the skepticism that is connected to technology resistance: “What I've seen . . . is that people tend to
assume that because it's technological it is better, and I am skeptical . . . I have to be honest with you. I've been pretty technology resistant.” Another digital immigrant connected technology resistance to fears of counselors becoming obsolete and being replaced by technologies:

There are big businesses that have come in and priced us out of our own profession in terms of access to test materials and being able to do assessments. So now, some big company is going to come in and try to replace us with some technology that's going to try to make us obsolete. People are very resistant to that, or maybe it's my age. I'm 56. Maybe that's what's happening with people my age, but there's a real concern about loss of control over the profession. (Dr. C, personal communication, December 15, 2014)

In discussing views about a course being required in emerging mental health technologies, two professors indicated a lack of technology use by faculty: “I'm sure it's not going to be across the curriculum because some people aren't even using the technology we have now” (Dr. C, personal communication, December 15, 2014); “I can think of a lot of counselors that aren't interested in using technology at all” (Dr. H, personal communication, December 16, 2014). Separate camps on the technology issue were further explained by Dr. D (personal communication, December 15, 2014):

Yeah. I think it depends on the professor. Some are going to be super excited about it. Some are going to be like, ‘Yeah. Really. Sure. Let's put this in here. I can definitely figure out a way to get some more technology into my class.’ And others are going to be like, ‘No. The way that I do it is the best way. Why would I change anything at all?’ Another digital immigrant professor alluded to an antitechnology sentiment when answering the question about a required course on apps or mental health technologies:
I think folks who are uncomfortable with technology would probably prefer a separate course be taught. I think they'll probably be kind of lost on where to even start in terms of finding the apps. Maybe I'm being too negative. I don't know. That's just from the people that I've experienced. But I think they'll be a little lost. (Dr. E, personal communication, December 16, 2014)

Surprisingly, one digital native reflected a personal antitechnology sentiment:

I'm so against all of these new advanced technologies. I'm more traditional in a sense. I use them when I have to and when it becomes forced on me. But I prefer not to… the identity of technology and the era of older people, they don't mesh. I think administrations have been trying to connect certain generations and technology together and there is this friction. (Dr. F, personal communication, December 15, 2014)

Dr. J (personal communication, December 16, 2014), a digital native, alluded to the hesitation to use technology by some, but also to an emerging appreciation of the value of technology in counselor education by others:

I can see both sides of it. So it's sort of this, ‘We've done things this way forever. There's no need to change. How could online counseling possibly work? How could we use technology in counseling?’ And then I think in this whole new realm that I'm in currently, I’m really learning to appreciate how technology can be used in counselor education and practice as well.

*Generational differences.* Nineteen references were made to generational differences with some indication of this gap’s being one reason for the disparity between positive attitudes about MHMAs yet lack of incorporating MHMAs into course curriculum. Nine out of the 10 participants made references to generational differences. Dr. A. said:
... so unless new people are coming into the field with those ideas (MHMAs), a lot of the counselors or counselor educators that have been out of school for a while are not necessarily going to seek that information and add that into their own teaching. I think that that has a lot to do with it.

Dr. A (personal communication, December 15, 2014) also noted that in this period of scant training on technology, professors are learning about mental health technologies from their students: “The things (technologies) that I know about, the stuff that school counselors use... I only know it because I talk to the students that are doing internships... that's how I learn a lot of that stuff.” Dr. G (personal communication, December 15, 2014) said some professors do not use computers and Dr. H (personal communication, December 16, 2014) said, “I can think of at least half of my colleagues who still use a flip phone.” Dr. G sees graduate students as much more tech savvy than most of the professors. Dr. C (personal communication, December 15, 2014) made a similar comment:

I'll tell you that the students are always ahead of the faculty on using technology; we have to catch up with the students. That's the facts. Students have had computers in their lives, and apps and whatnot in their lives all of their lives, and we have not.

Dr. B. (personal communication, December 16, 2014) and Dr. G. (Dr. G, personal communication, December 15, 2014) connected the disparity to differences between people who graduated many years ago and recent graduates; “Well I think it goes back to our training. How long ago was it when most of us completed our PhD?” (Dr. G, personal communication, December 15, 2014). Dr. B (personal communication, December 16, 2014) expects a technology paradigm shift as new counselors enter the profession:
A lot of new counselor educators…are going to become a new generation. I've been teaching for 20 years, and MHMAs are fairly new. I'm two-thirds of the way through my career, and this is fairly new for me. But for those of you that have come through programs and you're learning this as part of your training, as there's more of a turnover in the profession, you're going to see a shift happen.

Regarding a required course in mental health technologies, Dr. B (personal communication, December 16, 2014) further reflected on generational differences; “I think the younger ones will be okay with it, and the older ones will be resentful [laughter].” Dr. C (personal communication, December 15, 2014) shared similar thoughts; “It's what's going to be. It's the future. This is it. I think for my students, they would be very interested in all of this. But the faculty who's my age, we're like, 'Ugh,' you know”. Dr. G. (personal communication, December 15, 2014) also noted differences between generations regarding requiring professors to teach students about MHMAs:

I think you are going to have two different reactions. From the older faculty, you are going to get a lot of pushback. Some of the younger faculty may be more open to that but significant resources need to be dedicated to teach them how to train students in this area.

Dr. I (personal communication, December 15, 2014), a digital native professor who teaches at a private university, expressed similar thoughts on generational differences regarding a required course in mental health technologies:

I think there would be a pretty strong age difference. I think people who got their degrees 20, 25, or 30 years ago would be much more resistant to that idea than someone who got their degree five or 10 years ago and who's more willing to try these new things. I think
that's where the resistance would be…I really do think it would just be the comfort level with technology, and sticking to old models of education.

Another digital native, Dr. J (personal communication, December 16, 2014) expressed similar ideas:

I think anyone in this digital age, born in my generation and those upcoming can figure MHMAs out. And it’s not to say that can't be the case for folks in older generations as well, but we (people born in the digital age) are so used to using apps right now.

*Lack of awareness of MHMAs.* Also regarding the disparity between positive attitudes about MHMAs yet lack of teaching students about MHMAs, a theme of lack of awareness developed with sixteen references. This subtheme is related to the difficulties of training and keeping up with the quickly emerging MHMAs; “I don't know of any formal training, well, maybe there is, but I haven't seen any formal training” (Dr. A, personal communication, December 15, 2014). Dr. B (personal communication, December 16, 2014) mentioned lack of awareness several times during the interview and commented that her first exposure to a mental health app was in the quantitative phase of this study; “You had me do the survey before I had ever seen an app, and then again after I looked at it. And I had no awareness that those types of apps were even out there.” Dr. G (personal communication, December 15, 2014) has experience with MHMAs and was one of the 3% of educators who had assigned a MHMA-related project. But even though she is aware of MHMAs, she indicated that across the profession, there is a general lack of awareness and training. She noted that technology evolves so rapidly that it's hard to keep up with the new technologies. Dr. G (personal communication, December 15, 2014) sees this situation as a reason for the disparity; “So, it is something that's, you know, we all think it could be really helpful but no one really has the training or knows how to do it.” Along these
lines, Dr. H connected frequency of personal technology use in general with positive attitudes about MHMAs:

> I think the positive attitude is coming with recognizing that a lot more people use technology, they use their phones, things like that, frequently, and that this might be able to be incorporated, but still kind of having the question of how to incorporate it. (Dr. H, personal communication, December 15, 2014)

Dr. I (personal communication, December 15, 2014) also referred to the advances in technology since obtaining a degree as a reason for the disparity; “So I think that there is just that disconnect between the training we received when we were in graduate school, and where technology has come so far.” This professor further explained,

> Yeah, and I think that when you get into these things like CEUs, and things like that it's not even a topic of conversation for CEUs or at major conferences. For example I go to the Council on Social Work Education conference, and I've never seen a session on the use of mobile apps in education or in therapy. But I think most of us, particularly if they're educators, see the positive benefits that technology has in the classroom and even potentially with clients; so I think that explains the gap. The training always lags behind where things are. (Dr. I, personal communication, December 15, 2014)

Dr. J (personal communication, December 16, 2014) provided a synopsis that relates well to the other comments about lack of awareness of MHMAs as a reason for the disparity:

> I'm glad that you asked about the disparity, because I was actually thinking about that as I was answering the questions. I was thinking, ‘I know I'm not doing any of this, although I think it will probably be helpful.’ I think it's a lack of general knowledge. I was personally not aware that all of those kinds of apps were available. I do use an app for
domestic violence, as that's much the area that I deal with in my private practice. But I had not even thought about there being other apps available for other kinds of health issues. I think it's a general lack of awareness. I don't know why I didn't consider there were apps for everything…it just didn't cross my mind that there would be those sort of things available. I think it's a lack of awareness.

*Differences between face-to-face versus online approaches to instruction and therapy.*

As mentioned in the antitechnology sentiment section, Dr. A (personal communication, December 15, 2014) connected comments about disparity, generational differences, and the antitechnology sentiment to another subtheme that emerged: differences between face-to-face and online contact. Dr. A (personal communication, December 15, 2014) explained even more about the tension between professors regarding face-to-face and online contact as a reason or the disparity between positive attitudes about MHMAs but lack of teaching students about MHMAs:

I teach a hybrid career class, and it was a battle to get it, and every semester, I have to say, ‘Now, you know that class is a hybrid’ [chuckles] and then our students are kind of like, ‘I don't know about this hybrid thing’ because they're hearing from other faculty members, ‘Oh, well, you know, you have to have a certain personality to take a hybrid class.’ I'm like, 'No, you have to be a graduate student because graduate students have that personality.’ They're really just not up on the teaching, the pedagogy literature on it, which is very sad to me.

Dr. H (personal communication, December 16, 2014) made similar comments about the tension between two different camps in regard to the actual counseling environment:

Introducing different types of technology I think will make a lot of more traditional counselors nervous because it might feel almost threatening by reducing the amount of
face-to-face interaction time somehow... I think a big part of it is because counseling is predominantly or traditionally has been face-to-face. I know there's been resistance to things like distance counseling; anything like that. And part of it is, this sticking to the idea that there has to be this face-to-face relationship for counseling to work.

Dr. I (personal communication, December 15, 2014) expanded on the reason for the traditional preference for and benefits of face-to-face interaction in counseling field:

- I think with good reason, there is a bias towards the face-to-face, have to be in the office, have to read body language and nonverbal cues in addition to verbal cues. I think there's a benefit in one-on-one counseling to be in a clinical safe space where things can be shared and disclosed, and where that space isn't poison in some way. If I were doing counseling via Skype from my home or my office, there are other things that happen in that home and in that office, other than a counseling session, so I think that's a lot of it honestly.

Dr. A (personal communication, December 15, 2014) expressed the opinion that intentional disregard for technology is not the reason for disparity, but that biases naturally occur based on whether professors teach in face-to-face settings versus online settings:

- I think part of it depends on where somebody's coming from, but in terms of education, probably the online programs or the hybrid programs are teaching a lot more of that infused technology but a lot of doctoral programs aren’t teaching it.

Dr. E (personal communication, December 16, 2014) expressed similar ideas about this reason for the disparity:
My bias is I taught both residential and online. And as an online professor, I think that anyone of us would absolutely integrate technology. I think when I look back at the residential professors, for those who aren't so much interested in technology, they would probably not include MHMAs, not because of intentional disregard, but because it just wouldn't occur to them, it would not be second nature and wouldn’t happen unless it was really set forward as a priority by call of the chair of the department.

Other subthemes related to disparity. Several other explanations were offered as reasons for the disparity between positive attitudes about MHMAs and lack of teaching students about MHMAs. Three participants referred to time constraints of educators being too busy to learn about MHMAs. This sentiment was expressed by Dr. F (personal communication, December 15, 2014):

  Who's thinking about (new technologies and MHMAs) when we're teaching courses, when we're doing research, and when we're doing service…I'm not thinking about that because we have our own research service and teaching agenda…it sounds like a great idea but to keep up with the advancement that means that's an extra thing to do on my list.

Other reasons given for the disparity were fears about loss of control and being replaced (one reference) and the time required for an organizational shift in technology adoption to take place (one reference). Dr. F (personal communication, December 15, 2014) also indicated the influence of stringent ethical codes may be leading to avoidance of integrating emerging mental health technologies into pedagogy or clinical practice:

  …when cybercounseling became a topic, if you look at the ACA codes of ethics, ACA codes of ethics do not encourage you not to do cybercounseling, but they give you all
these points of consideration so much that it makes you say, ‘Oh, I'm not even doing that.’

**Concerns about MHMAs.** From the literature review it was clear that counseling professionals have ethical concerns about new technologies so much so that an ethical concerns variable was included in research question one in the quantitative phase and as a central phenomenon in the qualitative phase. The results of the quantitative data analysis for research question one did indicate that ethical concerns were significant influencers of behavioral intentions to teach students about MHMAs; comments expressed by interviewees offered deeper explanations about MHMAs-related ethical concerns. Thirty-three references to ethical concerns appeared in the interview transcripts. The most frequently mentioned concerns were that consumers will in some ways be harmed by using MHMAs as a replacement for therapy instead of a supplement to therapy (10 references) and quality control concerns (seven references). Four references each were related to concerns that use of MHMAs will contribute to the lack of human social interaction, concerns about liability, and concerns about privacy and confidentiality.

**Counseling replacement instead of supplement.** Based on her perception of the negative influence of assessment companies on mental health professionals’ abilities to earn assessment-related income, Dr. C (personal communication, December 15, 2014) expressed fear that MHMAs developed by large companies may somehow replace counselors: “So now, some big company is going to come in and try to replace us with some technology that's going to try to make us obsolete.” Dr. C (personal communication, December 15, 2014) also said,

I’m concerned people would be using MHMAs without the addition of having a therapist. I don't think an app can replace a person who was trained as a professional. It’s okay if
you use it as in the PE Coach app, where you use the app in addition to professional
treatment . . . where you take that home, and use the app to practice what you have
learned and apply it.

Dr. G (personal communication, December 15, 2014) noted financial concerns about MHMAs’
being a therapy replacement in view of other types of reimbursement issues. Although not
personally concerned about MHMAs replacing the work of therapists, Dr. G (personal
communication, December 15, 2014) indicated this may be a concern of some mental health
professionals:

This isn't my personal belief, but I think that maybe there might a fear that we would be
replaced by these apps and that a patient would not go into counseling if they could just
pull up a depression app themselves. And, since our field is being threatened so much
with issues of reimbursement . . . there may be some fear that apps might replace us as
professionals.

In talking about MHMAs-related’ learning goals for students, Dr. G (personal communication,
December 15, 2014) mentioned again the concern about MHMAs becoming a replacement for
therapy:

I’d want to teach students to know when to use apps, how to identify the good and the
bad, and how to integrate apps so that they are not used in place of the services
counselors provide, but that they are used complementary to what counselors provide to a
patient in session.

Dr. I (personal communication, December 15, 2014) expressed a similar sentiment: “I think apps
may be best as supplement, not a replacement for therapy.” Dr. I also noted the importance of
teaching others to use MHMAs as a supplement. Adding to the concern about MHMAs being a
replacement for therapy were concerns about consumers experiencing potential harm by using apps without the guidance and support of a therapist:

    My concern is that clients and improperly trained or insufficiently trained counselors are going to use apps . . . in place of proper therapy. My concern is that clients or potential clients will say ‘Hey, I have this problem.’ They'll go try and find an app and decide that that will help them solve their issue. I don't know if that's going to be sufficient, or if it's actually going to harm them. (Dr. H, personal communication, December 16, 2014)

Dr. J (personal communication, December 16, 2014) labeled the replacement versus supplement issue her biggest concern: “I think my biggest concern will be that folks would rely specifically on using apps only, and then not seek treatment in addition to that.”

    Quality control concerns. Several participants expressed concerns about lack of regulations and quality control for MHMAs and indicated that anyone may create and market apps. Dr. D (personal communication, December 15, 2014) for example said, “As far as I know…there's no requirement that a person who's making a mental health app be a licensed mental health professional of any kind, so there's no quality control at all.” Dr. B’s (personal communication, December 16, 2014) comment well captures this concern:

    Well, my concern is probably the same as it would be for anything else available on the Internet, which is there's no quality control . . . I teach a couple of assessment courses, and there's all kinds of personality tests online that have no basis. In terms of reliability and validity, we don't know anything about the credentials or the qualifications of the developers. Sometimes people will say right on a website, ‘I'm not a psychologist or counselor, but mental health stuff interests me’.
According to Dr. G (personal communication, December 15, 2014), a danger related to lack of quality control of MHMAs is that consumers will try to treat their issues with inaccurate information:

I think my biggest concern is finding apps that are credible, that are really based on science. There are a lot of things out there that you read and you think, ‘Well, that's probably not the most accurate.’ You don't want a patient taking that information in and assuming it to be fact. And also, apps that are not credible may actually be contradictory to things we may be teaching.

**MHMAs may contribute to lack of human social interaction.** Three educators indicated that, by using or encouraging the use of MHMAs, educators and counselors may be indirectly negatively contributing to interference with human social interaction. Comments by two professors highlight these concerns:

Over my years of teaching, and being in therapy myself, I've come to really value the relationship and being in the physical presence of another. I've watched my kids and how social skills and social norms are changing. They are texting all the time, instead of making eye contact. They text rather than talk on the phone. I feel like there's potential for something really important to get lost in the shuffle with the bright and shiny new thing. (Dr. B, personal communication, December 16, 2014)

If I had another reason why, I don't know, maybe it would be a more on a traditional level that I don't like people being glued to a phone. I hate to see this when people are at dinner. I was talking to a friend the other day and she said she and her fiancé were at a couples’ house and when the conversation went idle, her fiancé got on his phone and
started playing Candy Crush…and this is an older man. (Dr. F, personal communication, December 15, 2014)

**Fear of self-diagnosis and self-treatment attempts.** Closely related to the theme of concerns about MHMAs’ being used as a replacement for therapy were concerns that consumers would improperly self-diagnose or improperly approach treatment. Dr. D’s (personal communication, December 15, 2014) comment best captured this concern:

I probably wouldn't choose a diagnostic type app to give to clients and say, ‘Let's check out this app and see if you meet the criteria for PTSD,’ because I feel like a human who is trained in that is going to be better at diagnosis than any app . . . My fear would be that an app that was diagnostic in nature . . . could be misinterpreted by the client.

**Liability concerns.** Four references were made to liability concerns regarding the use of MHMAs in therapy. Dr. A (personal communication, December 15, 2014) compared this concern to liability issues with distance counseling and noted that some mental health professionals are unaware and uninformed about potential liability issues. In thinking through the session recording feature in the PE Coach app, Dr. E (personal communication, December 16, 2014) mentioned liability concerns about recording sessions:

On one of the listservs for ACA there have been questions about clients recording sessions. Certainly we are sensitive as counselors to that being a liability issue. There are multiple concerns such as, is your recording going to be skewed or edited in some way? Is it going to maintain confidentiality for the clients? So I guess the accessibility and the security of it would probably be everything. On that discussion, there was basically strong discouragement of recording sessions. But having seen the PE Coach app, I now think there is kind of a role in there potentially for recording. We need to ensure that
recordings are being used in beneficial ways and we need to ensure the client is clear about what we're doing with that recording.

Dr. E (personal communication, December 16, 2014) also wondered if educators are taking on liability issues related to particular MHMAs by teaching students about the apps: “I think that's one of the risks of us teaching a particular app is that are we may be taking on responsibility for the consequences of using a particular app.”

**Privacy and confidentiality concerns.** Along with her comments about liability issues surrounding session recording features on some mental health apps, Dr. E (personal communication, December 16, 2014) also mentioned concerns about security of personal and confidential information collected and recorded on phones, “And then beyond the recording it's also just the general confidentiality of helping the client understand security, of how secure is their phone, and the limitations that might have.”

When asked to discuss concerns about MHMAs, Dr. F (personal communication, December 15, 2014) associated confidentiality and privacy with the counseling profession:

My biggest concern is confidentiality. I think the counseling business is about privacy and confidentiality. When we think of technology, we do not tend to think of safety. I don't. I think of convenience, but because so many big corporations, banks, and businesses have been hacked for private information and have been compromised, I now think of safety. So technology . . . it's easy, it's convenient, it's fun, but it's not safe.

Dr. F’s (personal communication, December 15, 2014) interaction with PE Coach app incited thoughts about exposure of highly personal information to and the need to protect personal client information stored on phones:
If a person doesn't have a lock code on their phone, anybody can access their personal information. Another person could look at app icons and make assumptions about mental health issues like, ‘Oh what app is this? . . . Oh wow. Are you depressed? . . . Are you dealing with PTSD?’ The ability to access all this information about someone is not necessarily a weakness of apps, but it is an opportunity for exposure.

**Benefits of MHMAs to counseling.** A specific question about benefits of MHMAs was not included in the semistructured interview protocol; nevertheless, a theme of benefits of MHMAs to counseling developed (14 references). This theme is logically associated with one of the central phenomena investigated in the qualitative phase: educators’ perceived values of MHMAs. As a subtheme, personal use of apps by educators (15 references) is plausibly linked to benefits of MHMAs. Dr. A (personal communication, December 15, 2014) teaches some online courses at a public university and noted the usefulness of discussion boards for tracking students’ thoughts about case histories. Dr. A (personal communication, December 15, 2014) connected this ability to the helpfulness of technologies:

> When I'm reading discussions, like if I do a case, and I'm following a case with my students, I figure out so much about each student. I know more about them than if I'm teaching it in a class and walking around the classroom. In online discussions, I am able to catch students saying things that are not accurate, things they may all be thinking, a whole lot easier than I can in a class because they're not necessarily going to say those things out loud. So to me, using a lot of different technologies is actually incredibly helpful.

MHMAs are means of providing access to mental health care in rural settings, according to Dr. B (personal communication, December 16, 2014):
Yeah, like for people who live in very rural areas. I lived in Iowa for a number of years. It was not uncommon for people to travel an hour each way to come in for therapy appointments every weekend. So for someone like that, especially when they are moving into the later stages of therapy and just kind of needing some booster sessions ever so often, MHMAs could be very helpful.

Additionally, Dr. I (personal communication, December 15, 2014) noted that MHMAs offer important benefits in terms of access to mental health information and services:

I think part of it is that [chuckles] there are so many problems with the mental health system, including just not enough services available. Mental health mobile apps provide one way to sort of close that gap a little bit, so I think it's an incredibly important thing.

Dr. B (personal communication, December 16, 2014) noted that apps are beneficial as a supplement to therapy: “Mental health apps are another alternative. They are another platform and they provide another way to augment or supplement what we're doing.” Dr. F (personal communication, December 15, 2014) indicated use of MHMAs between appointments may help clients achieve counseling goals: “Apps offer additional assistance for helping clients to be more productive and for helping keep them focused and on the track in regards to their goals.” Dr. B (personal communication, December 16, 2014) indicated too that behavioral, cognitive, and cognitive-behavioral interventions are well suited as frameworks for mental health app interventions.

Dr. I is a digital native educator with moderate MHMAs’ experience who has required assignments related to MHMAs. While some educators noted privacy issues as a concern, Dr. I (personal communication, December 15, 2014) presented an alternative perspective regarding benefits of privacy afforded by the unique media of smartphones and digital tablets. Dr. I
(personal communication, December 15, 2014) indicated that the anonymity afforded by the ability to privately access mental health information on these devices may lead to more people being able to access mental health assistance, particularly males who may not participate in face-to-face therapy:

    I study men's mental health and men's help seeking, and so I think apps are actually really, really beneficial in that population specifically, because it's much more anonymous. 'It's just me and my phone, or my iPad or whatever.’ So I can see the benefits there.

Even though educators may be unaware of MHMAs or uncomfortable with using these technologies, Dr. I (personal communication, December 15, 2014) noted the existence of efficacy evidence on some MHMAs: “For the most part, there's pretty good research . . . that shows these apps do have some positive benefits.” Dr. I (personal communication, December 15, 2014) also indicated that clients may be more likely to complete homework on their phones because people are continually in possession of their phones as compared with prior therapy homework tools such as handouts and workbooks.

    Dr. J (personal communication, December 16, 2014) indicated that the ability to access apps anytime, anywhere offers clients opportunities to record their thoughts in vivo, in the moment. This may be more useful and accurate than asking clients to recall their thoughts, feelings, and behaviors days and weeks after an event:

    This was several years ago, and it was really before apps were a thing… I was working on a study with one of the faculty members from my doctoral program. She was on staff with Non-Suicidal Self Injury (NSSI). She was giving clients a handheld device where they could record their experiences, like what was happening when they felt like they
wanted to cut themselves. I think mental health apps are sort of the same idea . . . you are able to have apps right in your hand.

**Personal use of apps by educators:** Half of the participants indicated that they personally use health and mental health apps. These five educators noted that these apps are beneficial in assisting with weight loss, personal fitness, pregnancy support, stress relief, meditation, relaxation, and mindfulness. Dr. D (personal communication, December 15, 2014) said,

I use a lot of apps actually. There's a mindfulness app that I use regularly. I use a Fitbit and it has a fitness tracking app feature. There are a couple of other ones I use. There is a binaural beats app that helps with relaxation.

Dr. G (personal communication, December 15, 2014) also uses a mindfulness app and is currently using a pregnancy app to help monitor her pregnancy and understand the stages of development of her baby. She noted the personal and professional benefits of trying out apps:

“They are really helpful. I like to try them out myself before I recommend them to someone else. By doing so, there is personal and professional benefit, a two for one.” Dr. J (personal communication, December 16, 2014) also used pregnancy apps when she was expecting a baby and she currently uses an exercise app:

I use an exercise app for a seven-minute workout. It gives you all these exercises you can do in just seven minutes. It works well for those of us who don't have time to do anything else! And I also used several different apps when I was pregnant for tracking cycles and for tracking contractions . . . it definitely affected my mental health when I sort of knew what was going on with my baby . . .

**MHMAs training for educators.** Participants were asked if there existed a need for MHMAs training for educators and there were 41 references to this theme in the interviews. In
essence, participants revealed that there is a need to train the trainers of future mental health professionals in the use of MHMAs. This theme overlaps with the lack of awareness subtheme under the major theme of disparity between valuing MHMAs but not teaching students about MHMAs. All 10 participants agreed that educators need training in MHMAs and also that there is a dearth of training opportunities. Subthemes that developed were training venues and the purpose of training for the educators.

MHMAs training opportunities are needed. In Section 1 of the quantitative survey, 40% of the participants surveyed indicated that what they have learned about MHMAs came from their own exploration. Dr. G (personal communication, December 15, 2014) highlighted this trend: “I've purchased a few books that I'm reading through right now, but that's something that I've done on my own. There's been no training in this.” Dr. E (personal communication, December 16, 2014) noted that training on this topic is not commonplace: “Unless counseling professionals happen to come across a webinar and actually sign up for it, then I doubt they really have opportunities to learn about what's available with apps and how they may be beneficial.”

Regarding training at professional conferences, Dr. I (personal communication, December 15, 2014) said, “This is not a topic of conversation at major conferences. For example, I go to the Council on Social Work Education conference and I've never seen a session on the use of mobile apps in education or in therapy.” Dr. E. (personal communication, December 16, 2014) also indicated an absence of technology training at mental health conferences:
. . . there's certain categories they're always sure to cover at conferences. I think mental health technologies and apps certainly need to be a category in conferences so people can have the opportunity to go and learn about the technology pieces. I know most conferences I go to certainly don't have technology courses.

Because of continual changes in technologies, Dr. F (personal communication, December 15, 2014) was a bit uncertain about whether or not MHMAs will last, but expressed, “I think if this is going to be a new development in counselor education, then absolutely we need to become aware of the new trends.” Dr. H (personal communication, December 16, 2014) said, “There's a lot of learning that the instructors need to do before they're able to pass that information on to students.”

**Training venues.** As a result of the noticeable absence of available MHMAs’ training, educators were asked about appropriate venues for offering such training. All 10 participants offered suggestions for training venues. Venues suggested were Association for Counselor Education and Supervision (ACES) conferences; American School Counselor Association’ conferences; Chi Sigma Iota, an international and professional honors society; preconference workshops at APA or APA-division specific conferences; CSWE’s national conference; local conferences offered by the National Association of Social Workers; and CESNET, a counselor education listserv. Friendly, in-house workshops were also suggested.

**Price value of training courses.** Three participants noted the need to keep training affordable or even free for educators. One mentioned that free online courses are needed. Another mentioned that expensive courses on MHMAs will be a barrier to getting educators properly trained.
Training purposes for educators. Interviewees identified three major purposes for MHMAs training for educators. They indicated that counselor educators need training regarding the benefits of MHMAs and training regarding how to incorporate MHMAs into curriculum. They also indicated an overall need to increase awareness; this desire connects back to the disparity between valuing MHMAs but not teaching MHMAs theme and the general lack of awareness of MHMAs in the mental health field.

Voluntary versus involuntary training debate. Overall, there seemed to be ambivalence and conflicting views among participants as to whether or not training regarding mental health technologies and MHMAs should be voluntary or involuntary. This debate centered around whether or not licensing boards, ethical codes, and accrediting organizations should require mental health technology training. Forty-four references were on this topic. Dr. A (personal communication, December 15, 2014) captured the ambivalence: “So I don't know. I have kind of mixed feelings about it. But after going to our state conference and hearing some of the unethical things people were doing with technology, it is probably a really good idea.” Similarly, Dr. B (personal communication, December 16, 2014) said,

It's just going to become more and more of an issue the further along we go. There's going to be a point that CACREP and other accrediting bodies probably should be requiring counselor educators to be up to speed with apps and about technology in general. But like in the CACREP standards, they don't identify specific theories that they want you to teach, they just identify core things. I would say I think the same holds true for technology. I don't know that there should necessarily be requirements about specific technologies, like apps for example, but there should be some way to kind of prompt us,
or maybe go even further than prompt, and to say it's a mandate that we are to use technology in the curriculum in various courses.

Dr. E’s (personal communication, December 16, 2014) comments reflected ambivalence as well:

I tend to shy away from heavy restrictions or heavy things from states. I could see if you're required to have a CEU. Yeah, I could go along with that, if it included things related to digital records and HIPPA . . . considering some of the changes that have been made, it is not a bad idea. I think they would have to give a really strong justification for me to buy into the restriction though.

On the other hand, Dr. C (personal communication, December 15, 2014) firmly believes that mental health technology-related training should be voluntary and that practitioners need to determine their professional training needs: “It's got to be voluntary. Some people are just not going to be into it, and some people will. I think it's going to get really harder if you try to force people to do this.” Dr. A (personal communication, December 15, 2014) is also not a fan of required training:

I think that if you limit or specify to how many courses or how many CEs are needed in which areas to the point where they don't have any flexibility . . . like you need this much in ethics, you need this much in supervision, you need this much in technology, you need this much in mental health, and you need this much in psychopharmacology. Then counselors are not going have any leeway to actually learn about what's best for their clients.

Dr. D (personal communication, December 15, 2014) was an advocate for licensing boards to require training: “That would be cool. I would totally be behind that. That'd be awesome . . . I'm
all for it. Let's do it. And also I realize it won't happen tomorrow.” Dr. I (personal communication, December 15, 2014) also sees the benefits of required technology education:

I lean more towards requiring it, primarily because having worked in social work and having worked in a couple of different departments within the discipline, I know that things don't happen unless the accrediting body says they need to happen . . . So accrediting bodies need to put into their expectations and into their evaluations the use of technology, and technology education as part of a standard core curriculum.

Dr. J (personal communication, December 16, 2014) also recognizes the value of training and teaching requirements being set by guiding organizations:

I think I'd like to say yes to involuntary required training. Often times, we do things because we're required to do them. And I think, as with anything, there will be push back. Like, ‘You can't tell us what to do.’ Or, ‘We have academic freedom. You can't tell us what we have to teach’. Blah, blah, blah. I tend to be on the flip side of that. There should be someone probably telling us what to teach, and making sure our students are learning what they need to learn and that they are getting the knowledge they need to get . . . I don't think there's any harm in ensuring folks are getting a well-rounded base of CEs, rather than a pool of whatever mishmash you want.

**Teaching students about MHMAs.** As to be expected from participants who are counselor educators, the most references in the interviews were on the topic of teaching students about MHMAs (142 references). One subtheme was lack of consensus regarding requiring a course in mental health technologies in academic settings or infusing mental health technologies across and within courses. Another subtheme addressed teaching methods and objectives.
Controversy regarding requiring a technology course or infusing technology. Most of the participants expressed the idea that infusion of mental health technologies within and across courses would be the most effective approach to making sure students become proficient in the use of technologies. Eighteen references were made to infusing technologies. Ideas were offered for infusing technologies and MHMAs into various courses such as counseling techniques, ethics, theory classes, and internships. Dr. D’s (personal communication, December 15, 2014) comments reflect the preference for infusion of mental health technologies:

I actually think infusion would be more effective because mental health app technology is such a hands-on skill. Having students learn it while they are also learning theory, or ethics, or history, or whatever…incorporating it makes more sense to me than having a separate course all by itself.

Dr. H (personal communication, December 16, 2014) also advocated for infusion:

I think that it should be incorporated throughout in relevant courses or seminars, things like that. I think that it's important, because whether or not counselor educators want to talk about it, the apps are there. The need is there to talk about it and to make sure that we're sending out counselors who are doing it right.

The benefits of infusion of mental health technologies was also expressed by Dr. J (personal communication, December 16, 2014):

I think infusion would be more beneficial, because I think that there are so many areas that it applies to. So if you are talking about theory, "Okay, how can we use technology or how can we use apps to help you with the theory. If we are talking about crisis, how can we use crisis apps? …So I think that infusing it throughout, not adding one more thing, but infusing it throughout, will be much more beneficial.
As an alternative to infusion, educators were asked to discuss requiring a specific course in emerging mental health technologies. While some educators expressed positive thoughts about accrediting boards or counseling programs requiring a course in mental health technologies, 11 references were made to course requirements’ being so heavy that no room is available to add another course. Dr. C’s (personal communication, December 15, 2014) comments reflect this notion: “Where would we put a class like this? It would have to be an elective. There is no place to put this in terms of requirements.” Dr. G. (personal communication, December 15, 2014) concurred: “We are having trouble covering the courses that we are required to teach to maintain our accreditation. So adding an additional class would not be feasible unless we had more faculty and more resources.”

Dr. D (personal communication, December 15, 2014) conveyed a conflicting viewpoint:

Yeah. I think if we haven't required it, we're rapidly approaching that point if we aren’t there already. Technology is here and people are using it. They are going to use it whether they know how to use it or not. Requiring a course in technology is crucial. We need to do that.

**Teaching methods.** Educators expressed various ideas for methods to use in helping students develop competency in the evaluation and use of MHMAs. Requiring students to interact with and demonstrate proficiency with selected MHMAs, requiring a research project on selected apps and then demonstrating that app to other students, asking students to think critically about how to use particular apps with certain diagnoses, personally testing out apps over a period of time and reporting findings to the class, and selecting appropriate apps for particular clients during internships were offered as teaching methods. Requiring hands-on interaction was the most frequently mentioned teaching method for helping students develop
competency. MHMAs interaction was a method preferred by Dr. B (personal communication, December 16, 2014):

I think what I would probably do would be make a course assignment where each of them needs to find an app, and download it, and use it, and do some research about it, and then present to the rest of the class what the issues are. They could demonstrate the app on a projector have them get everybody else to download that app, and kind of walk them through how to use it. I do a lot of active learning. I get the students really involved in that process, so I would just make it part of the course expectation that they do that.

Each of the 10 educators expressed high regard for modeling the use of MHMAs to students. They labelled modeling as important, very important, and invaluable. Dr. E (personal communication, December 16, 2014) said, “I think modeling would be pretty important. I think it really helps a lot of students to understand, by visually seeing something or hearing something being used.” Modeling is akin to practicing what you preach according to Dr. A (personal communication, December 15, 2014):

I think anytime we teach we need to model it as much as possible because it's sort of like, ‘Why are you teaching me this if you don't think it's valuable enough to use it yourself?’

So even downloading a meditation app, or relaxation app, or one of the breathing apps, and showing students that you use it would be really great. I think it would be much more positive and the students would have more invested in it if you did it that way.

Dr. C (personal communication, December 15, 2014) noted that students want to see what their professors are doing and what tools they are using in the therapeutic environment. Dr. J (personal communication, December 16, 2014) also spoke highly of the importance of modeling as a teaching method:
I think everything that we do should be modeled. I think as counselor educators, we should be modeling all the things that we want out of our students. First, we're human and there's fallibility there. But I think if we're going to expect our students to use them, then we should be using them as should know how to use them as well. So yeah, I certainly really think the modeling would be an important component of that. If we're going to expect app use out of our students, we would have to be modeling the use of apps as well.

**Objectives and learning goals.** Several objectives and learning goals emerged as a means of contributing to the overall purpose of helping students develop competency in the use of MHMAs. The most frequently mentioned objective was for counseling students to learn to effectively evaluate and determine the efficacy of MHMAs as a result of ethical directives to practice based on empirical evidence; this theme was mentioned by nine out of the 10 educators with 13 references. Dr. B (personal communication, December 16, 2014) said:

> If we're going to teach students how to use apps with their clients, it is important to teach them how to be good consumers of that material, and to give them some skills for cross-referencing apps against what's out there in the literature about potential techniques for various conditions and disorders.

Participants also indicated the need to teach students how to integrate MHMAs with therapy. The need to help clients learn how to match apps with the abilities and needs of their clients was often stated.

**Integrating MHMAs with therapy.** Counselor education programs at the university level prepare students to be future mental health practitioners. While teaching students to integrate apps with therapy emerged as an objective in academic settings, participants also
expressed more thoughts about issues related to current practitioners’ integrating apps into therapy. Forty-nine references were made on this topic by participants. Although some of these aspects related to the integration of MHMAs in therapy overlapped with some of the other themes such as concerns and benefits, the comments here are more specific to actual integration with therapy.

The most frequently mentioned aspect of integrating apps with therapy was the need for counselors to determine the relevance of particular apps, the benefits of those apps, and the quality of those apps. Dr. C (personal communication, December 15, 2014) commented, “You want to make sure the information is accurate and is based on relevant literature.” Dr. F (personal communication, December 15, 2014) pointed out that because clients may already be using apps, counselors need to keep up with these emerging technologies and integrate them in a manner that is relevant. Closely related to determining relevance, benefits, and quality was the need to determine the empirical and evidence-based foundation of MHMAs before suggesting a client use an app. Along these lines, three professors mentioned the importance of determining the legitimacy of the app authors and evaluating the endorsements. This sentiment is reflected by Dr. G (personal communication, December 15, 2014): “You want to make sure it is sponsored or endorsed by some sort of professional society that can give it the seal of approval.”

Also in regard to integrating MHMAs with therapy, alignment with client issues was noted by five of the participants. Dr. H (personal communication, December 16, 2014) offered a thorough explanation of the need for alignment:

To evaluate the app for a client, I think user-friendliness would be one criteria. Also, counselors need to consider the types of activities the app asks the client to do and consider if those activities would lead to distress for that particular client . . . the skills of
the client, their ability to use apps needs to be considered along with thinking through considering whether or not that app is going to be helpful to your clients. I work with a lot of teenagers. They are pretty good at apps and they like them. So then for my teenage clients, I have to think about the information they will read on an app and if they will understand it. For example, if the app is talking about stress, do the teens know what stress is? So I have to consider the definitions and the information being put out by the app and determine if it is appropriate to the population I'm working with.

Ease of use was mentioned by six of the educators as an important consideration for integrating a MHMA with therapy. Dr. C (personal communication, December 15, 2014) said, “You want to be able to make sure that it is user-friendly so clients will not get frustrated using the app and give up.” The issue of developing competency with particular apps before recommending them to clients was indicated by five participants as an important requirement for the integration of MHMAs with therapy. Dr. F (personal communication, December 15, 2014) noted that some apps, like the PE Coach app evaluated by participants in the quantitative phase of this study, require therapists to obtain appropriate training in the underlying treatment modality. Dr. F (personal communication, December 15, 2014) said, “I think if an app requires training . . . that counselors should definitely go through that training so they are not using it haphazardly.” Two professors indicated the need for reinforcements and reminders such as push notifications to be built into MHMAs; if an app neglects to provide reinforcements to users, there exists potential for clients to stop using an app before the benefits have been maximized.

**Interest sparked by this research.** A final theme that emerged from the interviews was interest in MHMAs sparked by this research. This theme is mentioned as it highlights the influence of trialability that was investigated in research questions eight and nine in the
quantitative phase. Dr. A (personal communication, December 15, 2014) expressed plans to introduce the PE Coach app to her upcoming spring internship students. Dr. B (personal communication, December 16, 2014) said, “I feel a lot more optimistic and positive about the technology piece of things and the mental health apps than I did when I started your study. Thank you for that.” Dr. C (personal communication, December 15, 2014) said, “It’s been really interesting and I’ve already talked about this study with my students and will tell them what happened next.” Dr. D (personal communication, December 15, 2014) stated, “This is super fascinating stuff. I’m really happy that you are doing this.”

Dr. G (personal communication, December 15, 2014) mentioned a potential area for further research: “You know, I think that this is a really interesting topic that you're doing. So I'm really glad that you're doing this and exploring it. It would also be interesting, if it hasn't been done already, to investigate graduate students' perceptions of the need for training in this area.” Dr. H (personal communication, December 16, 2014) noted the importance of having this discussion with students about MHMAs and how to properly use them:

I just want to add that I think it's great that you're looking at this. I think it's definitely needed because I think there's a lot of counselors and counselor educators that don't even know mental health apps exist. It will be when their clients find mental health apps, or when they hear about these apps on the Internet, or hear about them from someone else that they start to understand mental health apps exist. So I think it's important to have this discussion about what mental health apps are and how to properly use them.

Dr. I (personal communication, December 15, 2014) noted three times during the interview that this study made him more interested in MHMAs. Lastly, Dr. J (personal communication, December 16, 2014) said,
Since I took your survey, I have been thinking about it. I wonder how I could implement some of these things in teaching an evidence-based course next semester. I am sort of throwing those things together now. I’m thinking about how I can look for apps that might be beneficial as I'm teaching that course, and what my students may find helpful.

**Summary of Results**

In this chapter, descriptions of the participants were presented for both the quantitative and the qualitative phases of this study on mental health mobile apps in counselor education. The pilot study was described and scale analysis data were presented. Results of the hypothesis testing and data analysis for the nine research questions were explained. Justification for rejecting the null hypotheses for research questions one, eight, and nine was provided based on descriptive and inferential statistics. Justification for the decisions not to reject the null hypotheses for questions two through seven was also presented based on descriptive and inferential statistics. The qualitative strand developed out of and was conducted after the quantitative strand, as is the proper order for a sequential explanatory mixed methods design. The data analysis for the qualitative phase included theme analysis, a description of the peer review of the theme analysis, and pertinent quotes from participants that highlighted the qualitative themes. The results of the mixed methods research questions will be discussed in the next chapter, the discussion, as the final means of connecting the quantitative phase results with the qualitative phase results.
CHAPTER V
DISCUSSION

The purpose of this study was to investigate mental health mobile apps (MHMAs) in
counselor education through the lens of unified theory of acceptance and use of technology
(UTAUT) (Venkatesh et al., 2003), innovation diffusion theory and the trialability concept
(Horan et al., 2006; Rogers, 2003), and generational influence on use of technology (Prensky,
2001). Ethical concerns regarding counselors’ admonishments to do only what is good for clients
and to do them no harm (ACA, 2014; APA, 2010) also served as a foundation. Because MHMAs
are an emerging technology, I located no prior research on the specific technology of MHMAs as
it relates to counselor education. The lack of research on MHMAs in counselor education
contributed to the decision to use a sequential explanatory mixed methods research design for its
potential to yield depth and breadth of information on a new topic.

I identified a number of studies in the literature review that indicated efficacy evidence
for a variety of MHMAs that had been investigated in randomized control trials and other types
of research designs. Knowledge of this efficacy evidence and awareness of lack of training
opportunities on the topic of MHMAs inspired in me a desire to better understand what is
happening in the counseling field regarding MHMAs. I selected counselor education as the
setting because counselor educators are key influencers of the development of future mental
health professionals.

A survey instrument was developed based on variables identified in the theoretical
foundation, particularly the UTAUT. The survey was peer reviewed, pilot tested, and then
revised according to scale analysis. Cronbach’s alpha scores in the pilot study of the instrument
ranged from a low of .705 on the facilitating conditions scale to a high of .927 on the
performance expectancy/relevance scale. Scale analysis was again conducted with the surveys completed by participants in the actual study after outliers were omitted. This scale analysis led to the omission of responses to four survey questions; this change did not alter the overall structure of the instrument. Cronbach’s alpha scores at this point ranged from a low of .714 on the facilitating conditions scale to a high of .954 on the ethical concerns scale. The final total instrument reliability on all scales combined was .927. The final reliability of the total values of MHMAs scale was .925. These scores indicated that the Mental Health Apps in Counselor Education Questionnaire is a reliable instrument. The questionnaire was also deemed to be reasonably valid based on evidence of face validity and content validity as noted by peers, and by the fact that the scales were based on the UTAUT, a theory confirmed to explain 70% of variance in intentions to use an innovation (Venkatesh et al., 2003).

Surveys were completed by 132 educators. Some responses were eliminated because of evidence of response sets and missing data. The analysis of descriptive statistics contributed to the elimination of 14 outliers. Included in the final dataset used for analysis were responses of 104 participants (N = 104). This sample size was sufficient to meet the requirements of the desired a priori statistical power requirement of .80 with an alpha level (α) of .05 that had indicated a minimum required sample size of 98 (Cohen, 1992).

Participants represented a cross-section of professors who currently teach in graduate-level counselor education programs across the country and in every region of the U.S. Participants had doctorate degrees (87%), specialist’s degrees (.78%), and master’s degrees (12.4%). They taught in programs that provide graduate degrees in counseling, marriage and family therapy, addictions counseling, school counseling, social work, psychology, and psychiatry. Both public (68%) and private universities (33%) were represented. Programs
offering online counselor education were also represented. The participants served in various levels of professorship: professors (14%), associate professors (19%), assistant professors (46%), and adjunct professors (21%). Many participants also had professional licenses in the mental health field. Seventy percent of participants were digital immigrants born prior to 1980, and 30% were digital natives born in 1980 or after. With such representation and diversity of participants comes confidence that perspectives offered by the sample represented the population of counselor educators. One major limitation of the sample, however, was that in order to participate, educators must own a smartphone and be willing to download the PE Coach app. This requirement likely excluded the opinions of educators who may have ideas about MHMAs in counselor education that were different from those of professors who already had smartphones.

Information collected from the quantitative and qualitative data analyses, individually and collectively, provided insight regarding the three central research questions that guided the study: (a) What factors influence counselor educators’ values of MHMAs as therapeutic tools? (b) What factors influence counselor educators’ behavioral intentions to teach counseling students about MHMAs? and, (c) To what extent are graduate counseling-related programs contributing to future counselors’ technological competence particularly regarding their ability to evaluate and integrate MHMAs? These three questions are used to direct this interpretation of the results. I will connect the quantitative and qualitative results throughout this discussion, and I will thereby answer the two mixed methods research questions: (a) Does the qualitative interview data explain the quantitative results about MHMAs? If so, how and to what extent? and, (b) did results emerge from comparing the quantitative survey data with the qualitative
interview data on the topic of MHMAs in counselor education? If so, what results emerged from this comparison?

The results of the hierarchical regression for $R_1$ indicated that the independent variables identified by the UTAUT, specifically performance expectancy/relevance, effort expectancy, attitude, social influence, and facilitating conditions, indeed influenced counselor educators’ behavioral intentions to teach students about MHMAs when considering the moderating influences of gender, age category, level of MHMAs experience, and voluntariness of use. The added variables of anxiety/apprehension and ethical concerns also appeared to influence educators’ behavioral intentions to teach students about MHMAs. The variables considered collectively accounted for 51% ($R^2$) of the variance in behavioral intentions to teach students about MHMAs. Themes identified in the qualitative analysis also supported the influence of the independent variables on intentions to teach students about MHMAs. Participants in the qualitative phase noted the importance of considering relevance, benefits, ease of use, efficacy evidence, and credibility of MHMAs before recommending that students or clients use the apps. The qualitative participants also mentioned ethical concerns about the use of MHMAs such as liability issues, privacy and confidentiality concerns, and making sure that selected apps benefit clients and do them no harm.

$R_2$ and $R_3$ in the quantitative phase were used to investigate differences between Prensky’s (2001) identified generational categories, digital immigrants and digital natives, and personal use of MHMAs by counselor educators. These questions were asked because they relate to the important role that modeling has in helping students learn (Bandura, 1977); it was reasonable to expect that educators who personally use apps would be more likely to model those apps in teaching environments. Based on statistical analyses, decisions were made not to reject
the null hypotheses for R2 and R3 as there were no significant differences between digital
immigrants and the digital natives on number of health and mental health app downloads. The
positive skews on both the number of health apps and number of mental health apps downloaded
to phones of educators offer insight into MHMAs being an emerging technology that has not yet
catched on in a field that, according to participants in the qualitative phase, has been heavily
influenced by an antitechnology sentiment and a preference for face-to-face human interaction
over technology.

Generational category was also not significantly related to behavioral intentions to teach
counseling students about MHMAs or total values of MHMAs in R4 and R5. In the qualitative
phase, however, generational differences surfaced as a subtheme within the theme of disparity
between valuing MHMAs, but not teaching students about MHMAs. This difference between the
results of the two phases of research regarding generational category is a mixed methods result
that emerged from comparing the quantitative survey data with the qualitative interview data.
The generational differences subtheme that emerged in the qualitative strand points to the fact
that more traditional, and likely older, educators who do not own smartphones were excluded
from this study. The lived experiences of counselor educators as expressed by the qualitative
phase participants indicated that there are differences between digital immigrants and digital
natives regarding technology use and acceptance. If this study had not included the qualitative
phase, the quantitative results alone in R2 through R5 would have pointed to no generational
differences between educators. This finding highlights the value of a mixed methods study.

It is important to understand the reason for the total average values of MHMAs scale that
was included in this study when the UTAUT has no such scale. In the early research design
planning phase, I gave much thought to the main dependent variable in the UTAUT, behavioral
intentions to use a technology. I became concerned that this variable alone would be insufficient for measuring counselor educators’ behavioral intentions to teach students about MHMAs, particularly because not all educators teach courses that would be ideal or appropriate for integrating instruction about MHMAs. With this concern in mind, I thought it useful to also find a way to measure educators’ perceived values of MHMAs, and I decided to combine the average scores on the performance expectancy/relevance scale, the effort expectancy scale, and the attitudes scale. The perceived values scale was used as a dependent variable in several of the research questions. Perceived values of MHMAs were also reflected by two themes identified in the qualitative strand: benefits of MHMAs and interest sparked by this research study.

The purposes of R₆ and R₇ were to investigate differences in level of online course offerings and behavioral intentions to teach students about MHMAs and total values of MHMAs. The idea was that educators who are immersed in an online education program would likely have different perceived values of MHMAs than educators who are not immersed in technology-enriched programs. Data analysis of these two questions in the quantitative strand indicated no significant differences. Since 72% of the universities that were represented by participants offered at least some online courses in their counseling programs, however, the sample may have been too similar for differences to surface. In contrast to the quantitative results, comments made by educators in the qualitative strand indicated differences between educators who teach only in face-to-face environments and educators who teach online. This is another example of the value of the mixed methods research design.

In reading Rogers’ (2003) narratives about the impact of trialability on use of new innovations, I wondered if trying out an evidence based MHMA would lead to higher scores on behavioral intentions to teach students about MHMAs and total values of MHMAs. Investigating
the influence of trialability was integral to the design of this study, particularly research questions R₈ and R₉. In order not to give away information that could interfere with the study, participants were not told in advance that the evaluation of the PE Coach app was for the purpose of investigating the influence of trialability.

There were significant differences between pre- and postmeasure scores on behavioral intentions to teach students about MHMAs and total values of MHMAs after interaction with and evaluation of the PE Coach app. This finding ties in well with educators’ comments in the qualitative phase about the value of personally interacting with MHMAs before attempting to teach students about these technologies and before attempting to integrate MHMAs into therapy. Trialability, or interaction with MHMAs, is also closely related to modeling MHMAs to students and clients. Participants offered many comments about the value of modeling MHMAs. Trying out the PE Coach app (trialability) sparked interest in learning about, teaching about, and integrating the use of MHMAs into therapy. In this instance, the qualitative findings further confirmed the quantitative findings. By comparing the two research strands in the mixed methods analysis, it was found that the qualitative comments confirmed and expanded understanding of the quantitative results for R₈ and R₉.

**Implications for Counselor Education and Therapy**

A summary of implications for counselor education and therapy is offered in Figure 31. Educators who wish to determine if particular MHMAs are worth teaching to students or worth recommending to clients may use the variables in R₁ to assist in the decision making process. Educators may also use a process similar to that used in this study for the PE Coach app evaluation. Educators could interact with MHMAs of interest and then evaluate those apps according to the UTAUT variables along with the anxiety/apprehension and ethical concerns
variables. In fact, it may be useful for the app evaluation instrument to be further researched and developed for such purposes. With the current absence of quality control of MHMAs, such an instrument could prove valuable to educators who are trying to determine which apps they want counseling students to explore and to practitioners who want to evaluate MHMAs prior to recommending them to clients.

<table>
<thead>
<tr>
<th>Research Implications for MHMAs in Counselor Education and Therapy</th>
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<tbody>
<tr>
<td><strong>MHMAs have potential for access, psychoeducation, therapy enhancement, initiatives to drive eHealth and mHealth paradigm shift</strong></td>
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<tr>
<td><strong>Counseling educators are interested in MHMAs but need training opportunities</strong></td>
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<tr>
<td><strong>Educators need opportunities to interact with MHMAs in CE courses and conference seminars</strong></td>
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<tr>
<td><strong>Digital technology course is unlikely: Educators need to INFUSE MHMAs into courses</strong></td>
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<tr>
<td><strong>Educators need guidance on HOW to infuse MHMAs into curriculum</strong></td>
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<tr>
<td><strong>Students need to interact with MHMAs</strong></td>
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<tr>
<td><strong>Students need to develop competency in evaluating MHMAs and using MHMAs</strong></td>
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<tr>
<td><strong>Alignment of MHMAs with needs of clients is crucial</strong></td>
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<tr>
<td><strong>In absence of quality control, there is a need for a database of MHMAs reviews</strong></td>
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<tr>
<td><strong>A need exists for a user-friendly MHMA evaluation instrument</strong></td>
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<tr>
<td><strong>Developers need to consider relevance, psychological theory basis, apps that support therapy, safety and privacy, and efficacy evidence</strong></td>
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*Figure 31. Research implications for MHMAs in counselor education and therapy*

Because of the voluntary versus involuntary training debate theme that appeared in the qualitative strand, the voluntariness of use covariate warrants discussion. While people desire choices, many also avoid taking on extra responsibilities if they are not required to do so. Educators in the qualitative phase conveyed a sense of being overwhelmed with course
requirements and a pervasive antitechnology sentiment in the counseling profession. Some participants expressed that infusion of mental health technologies and MHMAs into counselor education is unlikely to happen if infusion is voluntary, even though most prefer it to be a choice and not a requirement. Against the backdrop of overwhelmed counselor education departments, the pervading antitechnology sentiment, the fact that thousands of MHMAs are available to consumers, and the fact that smartphones are ubiquitous in society, accrediting organizations and licensing boards have pressing and difficult decisions to make concerning whether or not to require education on MHMAs and other mental health technologies.

The positive relationships between trialability and use of MHMAs and values of MHMAs have several implications. First, those relationships highlight the need for hands-on interaction with MHMAs in continuing education environments and academic environments. Secondly, they highlight the ethical requirement to use evidence-based treatments and technologies. Asking students or clients to use MHMAs that do not have efficacy evidence is irresponsible and unprofessional. Such behavior may also contribute to harming people and to liability consequences for educators and counselors who do not take time to ensure the MHMAs they recommend were developed by qualified mental health professionals, are evidence-based, and have been demonstrated to have efficacy.

The need to be ethically responsible, however, should not discourage counselor educators and counseling practitioners from using MHMAs. Global and national initiatives were identified in the literature review about efforts to use MHMAs to enhance equity and access to mental health psychoeducation and interventions. With these efforts in mind, it may be said that failure to maximize and even exploit innovations for the benefit of clients is ethically irresponsible. The goal must be to balance ethical concerns with maximizing the benefits of MHMAs (Figure 32).
One of the goals of this study was to determine the extent to which counseling programs are contributing to future counselors’ technological competencies, particularly regarding their ability to evaluate and integrate MHMAs into therapy. Data collected from Section 1 of the survey instrument along with comments made by educators in the qualitative phase of research indicated that very few educators are teaching counseling students about MHMAs. Only four counselor educators indicated that they had required students to complete an MHMAs-related research project or assignment in the past year.

In part, the near absence of instruction regarding MHMAs is to be expected because MHMAs are an emerging technology. Also, counseling is more of a social interaction field than it is a technology-embedded field. At the same time, thousands of mental health apps are available, and little is being done to train the trainers about MHMAs at professional conferences or in other types of continuing education (CE). If MHMAs are not included in conference sessions and CE trainings, then the educators who are responsible for preparing up-and-coming counselors will not be adequately prepared to teach students about MHMAs.
Limitations

Findings from this study may not be generalized to populations other than counselor educators or to technologies other than MHMAs. Even though the participant sample had diversity in terms of regional location, generational category, and gender, the similarities of the educators in terms of technology adoption with all participants having smartphones reduced the generalizability of the findings (Warner, 2013). Survey responses may be limited by their being self-report surveys. In addition, the findings are limited by the use of only one MHMA, the PE Coach app. If educators evaluated a different MHMA, there may have been different research outcomes.

Recommendations for Future Research

Efforts were made to clearly explain the research methods and data analysis process for replication purposes. It will be useful for this study to be replicated in a few years in order to determine the diffusion of MHMAs within the mental health field. If this study is replicated, it is recommended that other evidence-based apps be used for the MHMA evaluation in order to determine if evaluating different MHMAs will contribute to similar or different results. Also, as one participant noted, it will also be useful to investigate the attitudes of counseling students regarding MHMAs. Another recommendation for future research is to use an experimental design with a control group in order to improve robustness and generalizability of findings.

Most important is the need for efficacy studies on individual MHMAs. Although randomized control trials (RCTs) are highly desirable, the time lag with RCTs is often a problem. Researchers may also follow the directives identified in Kumar et al. (2013) for alternatives to the RCT approach in mHealth evidence generation. In addition, the Continuous Evaluation of Evolving Behavioral Intervention Technologies (CEEBIT) method as described by
Mohr et al. (2013) in which smartphone capabilities are maximized for collecting data and generating evidence is another valuable research approach.

**Summary and Conclusions**

This mixed methods study on mental health mobile apps in counselor education provided evidence that UTAUT (Venkatesh et al., 2003) along with the variables of ethical concerns and anxiety are related to counselor educators’ behavioral intentions to teach counseling students about MHMAs. The qualitative data collected explained in more depth some of the quantitative results about MHMAs in counselor education. The mixed methods analysis revealed that some quantitative findings were confirmed by the qualitative research strand, while other quantitative findings were contradicted by the qualitative research strand. The contradictions were not deemed to be problematic, but useful for investigating reasons for the contradictions.

It is clear that efficacy evidence exists for some mental health apps. In addition, as participants mentioned, MHMAs may be beneficial in enhancing therapy. This study indicated the value of trialability in inspiring positive change and diffusion of such evidence-based, beneficial innovations throughout a social system (Rogers, 2003). Hands-on interaction with evidence-based apps will contribute to positive changes in behavioral intentions to teach students about MHMAs and total values of MHMAs. This will in turn, enhance the diffusion of MHMAs throughout the mental health social system.

It is my hope that this study will encourage professional associations to include conference tracks on mental health technologies, but to steer away from addressing only the ethical concerns about MHMAs in those tracks. Addressing ethical concerns without addressing the benefits of MHMAs will serve only to push counseling professionals even further away from maximizing the benefits of mental health mobile apps. Another approach for addressing
emerging technologies at conferences is to infuse technology instruction into other tracks. For example, speakers presenting in treatment tracks may be encouraged to infuse related MHMAs into their presentations.

A second hope inspired by this research, is that educators in conference environments and in academic environments will model the use of MHMAs by incorporating hands-on interaction with MHMAs as an instructional method. Conference attendees and students could be asked to interact with evidence-based MHMAs during presentations. In addition, presenters may take advantage of wireless technology capabilities for magnifying to a big screen, page-by-page demonstrations of apps that have been downloaded to their own smartphones.

A third hope is for counselor educators to be emboldened to cross the technological divide and teach up-and-coming counselors how to evaluate and integrate MHMAs into therapeutic treatment. Along these lines, it is hoped that educators will incorporate MHMAs as learning tools. The plethora of existing MHMAs offer opportunities for students to learn about mental health diagnoses and treatments in a culturally-relevant and engaging manner.

A final hope is that this study will inspire counselor educators, as experts in the mental health field, to partner with students and developers in creating psychologically sound, evidence-based apps. Just as engineering students develop new technologies, and just as MBA students manage real stock portfolios, so may counseling students under the mentorship of counseling professors create mental health mobile apps for the benefit of society.
REFERENCES


Retrieved from http://psychcentral.com/blog/archives/2013/01/16/top-10-mental-health-apps/


doi:10.1016/j.amepre.2013.03.017


Appendix A

Permission to Use Service Oriented Unified Theory of Acceptance and Use of Technology (SOUTAUT) Instrument
From: Marlene East <mle14@students.uwf.edu>
Date: Fri, Nov 8, 2013 at 12:26 PM
Subject: Measuring Levels of End-Users' Acceptance and Use of Hybrid Library Services
To: ptibenderana@gmail.com, gaao@ct.mak.ac.ug, ikoja@easils.mak.ac.ug, wokala@lsce.mak.ac.ug

Dear Ms. Tibenderana, Dr. Ogao, Dr. Ikoja-Odongo, and Wokala,

I read your 2010 article in the International Journal of Education and Development using Information and Communication Technology. I am a student in the EdD department at University of West Florida. I am writing my Dissertation Proposal on the topic of counselor education regarding emerging mental health mobile app technologies.

I am planning to use UTAUT (Venkatesh, et al., 2003). Your article indicates you used a survey instrument of 46 statements adopted from Venkatesh. I am wondering if you would be willing to share that survey instrument with me. I am interested in modifying it for use in my study.

Thank you kindly for your consideration.

Marlene East, LMHC
EAST Counseling Services, Inc.
6521-A North Lagoon Drive
Panama City Beach, FL 32408-3730
website: www.eastcounseling.com

From: Prisca Tibenderana <ptibenderana@gmail.com>
Date: Wed, Nov 13, 2013 at 12:16 AM
Subject: Re: Measuring Levels of End-Users' Acceptance and Use of Hybrid Library Services
To: Marlene East <mle14@students.uwf.edu>

Dear East,

Sorry, I was too busy yesterday that I forgot to send you the instruments. You will realize that when we used it, it was still being development for my Ph.D study. What I am attaching is the refined instrument. The title of the thesis is also included.

I wish you all the best.
Prisca

On 11/11/2013, Marlene East <mle14@students.uwf.edu> wrote:
> Thank you kindly. I will be glad to acknowledge the source. Thanks again.
> Marlene East

From: Prisca Tibenderana <ptibenderana@gmail.com>
Date: Wed, Nov 13, 2013 at 12:24 AM
Subject: Study Instrument
To: Marlene East <mle14@students.uwf.edu>

I have found it much easier to sent the instrument this way. I hope you will find it useful. Kindly acknowledge receipt.

Prisca

---

Dr. (Mrs.) P. K. G. Tibenderana,
P. O. Box 8662,
KAMPALA.
Appendix B

Service Oriented Unified Theory of Acceptance and Use of Technology (SOUTAUT) Instrument
Questionnaire for Library Services Users: Academic Staff and Students

<table>
<thead>
<tr>
<th>SECTION 1: BACKGROUND INFORMATION</th>
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<tbody>
<tr>
<td>Q101</td>
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<td>Q102</td>
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<td>Q103</td>
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<td>Q112</td>
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NOTE: Section 2 of the SOUTAUT was removed for the current study as it is only relevant to library hardware and all remaining questions have been modified for the instruments in this study on counselor education regarding mental health mobile apps.

SECTION 3: In the subsections that follow, please indicate by way of ticking in the right column, the extent, to which you agree with the given statements in relation to ICT library services in your university, where:

1= strongly agree; 2 = Agree; 3 = Neutral, 4 = disagree; 5 = strongly disagree

<table>
<thead>
<tr>
<th>Q301</th>
<th>Awareness of the electronic library Services</th>
<th>1</th>
<th>2</th>
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<th>5</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>I came to know about electronic library services offered by the university because of the important role they play in an academic environment.</td>
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<td>2</td>
<td>I knew about e-library services offered by my university because they are very relevant.</td>
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<td>3</td>
<td>My colleagues and friends told me about the existence of electronic library services.</td>
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<td>4</td>
<td>I came to know about e-library services because of the facilitating conditions around.</td>
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<td>5</td>
<td>I knew about e-library services from the library website</td>
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<tr>
<th>Q302</th>
<th>Performance Expectancy</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>1</td>
<td>I find electronic library services useful for my teaching/study/research.</td>
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<td>2</td>
<td>The available electronic library services enable me to find information quickly than it would have been otherwise.</td>
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<tr>
<td>3</td>
<td>Using electronic library services increases my chances of getting information that helps me with teaching/research/study productivity.</td>
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<tr>
<td>4</td>
<td>Using electronic library services increases my chances of finding the information I require for writing academic papers/class assignments.</td>
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<tr>
<td>5</td>
<td>I do not use e-library services because they are not user-friendly.</td>
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<table>
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<tr>
<th>Q303</th>
<th>Relevance of Electronic Library Services</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I find e-library services relevant because they increase my self-esteem or recognition amongst colleagues</td>
<td></td>
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<td>2</td>
<td>I find e-library services relevant for our local academic environment because of the links they provide to the outside world.</td>
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<td>3</td>
<td>I find e-library services relevant for our local environment because currently there are no enough print books and journals in our library to circulate.</td>
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<td>4</td>
<td>I find e-library services relevant for our local environment because our library does not have recently published books and journals</td>
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</tbody>
</table>
I find electronic library services relevant for my personal development because I am able to get information I require in my field to write papers/class assignments.

I can access e-library services whenever I am as long as I have a computer connected to the university intranet.

<table>
<thead>
<tr>
<th>Q304</th>
<th>Social Influence</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>My colleagues and friends have influenced me to use electronic library services.</td>
<td></td>
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<tr>
<td>2</td>
<td>People who are important to me have influenced me to use electronic library services.</td>
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<tr>
<td>3</td>
<td>Management of this university has supported the use of electronic library services.</td>
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<tr>
<td>4</td>
<td>The society around me has influenced me to use electronic library services.</td>
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<tr>
<th>Q305</th>
<th>Facilitating conditions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>The university is very supportive and has provided necessary facilities needed for me to use electronic library services.</td>
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<td>2</td>
<td>I have the skills required to use electronic library services.</td>
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<td>3</td>
<td>Electronic library services are compatible with the university Local Area Network (LAN).</td>
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<td>4</td>
<td>There is always uninterrupted electricity supply to enable me access e-library services</td>
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<tr>
<td>5</td>
<td>The university has high speed Internet connection that allows me quick access to e-library services</td>
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<td>6</td>
<td>Librarians are available to assist me with electronic library services difficulties.</td>
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<td>7</td>
<td>I do not use e-library services because I can hardly get time to learn how to use them or use them</td>
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<tr>
<th>Q306</th>
<th>Behavioural Intention to use electronic library services</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>1</td>
<td>I intend to use the electronic library services in the next six months.</td>
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<td>2</td>
<td>I predict I shall use electronic library services in the next six months.</td>
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<td>3</td>
<td>I plan to use the electronic library services in the next six months.</td>
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<td>4</td>
<td>I must use the electronic library services in the next six months.</td>
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<tr>
<td>5</td>
<td>I already use electronic library services</td>
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<tr>
<th>Q307</th>
<th>Expected benefits of the e-library services</th>
<th>1</th>
<th>2</th>
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<tr>
<td>1</td>
<td>I use electronic library services so that I can gain access to both offline and online library resources.</td>
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<td>2</td>
<td>I use e-library services so that I can become competitive in my profession</td>
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<td>3</td>
<td>I use e-library services so that I can remain current in my field of study/research.</td>
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<td>4</td>
<td>I use e-library services because I have been able to save costs on purchasing books or journals.</td>
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<td>5</td>
<td>I use e-library services because they help me to improve my typing skills or Internet searching skills.</td>
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</table>
I use e-library services because I can communicate with my peer groups or colleagues

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<thead>
<tr>
<th>Q308</th>
<th>Behavioural usage</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>1</td>
<td>I find using e-library services enjoyable</td>
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<td>2</td>
<td>I find the process of using e-library services pleasant</td>
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<td>3</td>
<td>E-library services make my work interesting</td>
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<td>4</td>
<td>Once I start using e-library services, I find it hard to stop</td>
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<td>5</td>
<td>Using e-library services is educative</td>
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<tr>
<td>6</td>
<td>Using e-library services is fun</td>
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<tr>
<td>7</td>
<td>Using e-library services is boring</td>
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<tr>
<td>8</td>
<td>Using e-library services is frustrating</td>
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</table>

SECTION 4: Recommendations

**Q401.** Please indicate any other e-library services you know of (if any) and would like to see in your university library?
1. 
2. 
3. 

**Q402.** Please indicate any other e-library information resources you know of (if any) and would like to see in your university library?
1. 
2. 
3. 

**Q403.** What suggestions would you like to make to ensure that non-users of e-library services can use the resources?
1. 
2. 
3. 

**Q404.** Please, what recommendations would you like to make to improve e-library services in your University?
1. 
2. 
3. 

*I thank you.*
Appendix C

Mental Health Mobile Apps in Counselor Education Questionnaire
Mental Health Mobile Apps in Counselor Education Questionnaire was a four part survey. Participants completed it in one block of uninterrupted time, and this took about 30-45 minutes.

1. Section 1: Demographic information

2. Section 2: View about mental health mobile apps (pretest, identical to Section 4)

3. Section 3: The intervention: Evaluation of PE coach app (prolonged exposure therapy for posttraumatic stress disorder treatment (PTSD)

4. Section 4: Views about mental health mobile apps (postmeasure, identical to Section 2)

For more information about this instrument, please contact the principal researcher, Marlene East, mle14@students.uwf.edu.
Appendix D

Prolonged Exposure Therapy, PE Coach App
PE Coach App

From National Center for Telehealth and Technology (T2):
http://www.t2.health.mil/apps/pe-coach


Prolonged Exposure (PE) is an evidence-based psychotherapy for post-traumatic stress disorder (PTSD). Through both imaginal exposure to memories and live exposure to typically avoided situations, PE empowers those living with PTSD as they learn to process their memories and modify their behaviors. The PE Coach application (app) for mobile devices was created to improve convenience for clinicians and patients as they adhere to the procedures of the published PE treatment manual.

Running on the Android and iOS platforms, PE Coach brings the following functionality to your smartphone or tablet:

For Clinicians:
- Audio record the PE session directly to the patient’s mobile device
- Receive session-by-session feedback on patient’s homework and practice completion via app use and activity
- Track symptoms over time to evaluate treatment outcomes

For Patients:
- Always available in-app homework forms to record completed tasks
- Audio/visual education on exposure therapy and common reactions to traumatic experiences
- Interactive respiration retraining
- Easily accessible session recordings
- Scheduling capability to ensure the best treatment results

How PE Coach Can Help You

The first step to using PE Coach is getting into treatment with a qualified therapist trained in PE. PTSD is a serious condition that often requires professional evaluation and treatment.

The PE Coach app is designed for use by patients and therapists, together, during clinical care; it does not provide self-help, nor does it provide stand-alone treatment. It is designed to streamline the professionally-guided treatment of PTSD. Experienced PTSD treatment professionals can be found at DoD and Veterans Affairs behavioral health facilities around the world.

Collaborators

PE Coach was developed in collaboration with the National Center for PTSD and The Center for Deployment Psychology.
Appendix E

IRB Original Approval
Ms. Marlene East
6521 N. Lagoon Drive
Panama City Beach, FL 32408

August 15, 2014

Dear Ms. East:

The Institutional Review Board (IRB) for Human Research Participants Protection has completed its review of your proposal titled "IRB 2015-013, Mental Health Mobile Apps in Counselor Education," as it relates to the protection of human participants used in research, and granted approval for you to proceed with your study on 09-01-2014. As a research investigator, please be aware of the following:

* You will immediately report to the IRB any injuries or other unanticipated problems involving risks to human participants.

* You acknowledge and accept your responsibility for protecting the rights and welfare of human research participants and for complying with all parts of 45 CFR Part 46, the UWF IRB Policy and Procedures, and the decisions of the IRB. You may view these documents on the Research and Sponsored Programs web page at http://www.research.uwf.edu/irb. You acknowledge completion of the IRB ethical training requirements for researchers as attested in the IRB application.

* You will ensure that legally effective informed consent is obtained and documented. If written consent is required, the consent form must be signed by the participant or the participant’s legally authorized representative. A copy is to be given to the person signing the form and a copy kept for your file.

* You will promptly report any proposed changes in previously approved human participant research activities to Research and Sponsored Programs. The proposed changes will not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the participants.

* You are responsible for reporting progress of approved research to Research and Sponsored Programs at the end of the project period 10-31-2014. If the data phase of your project continues beyond the approved end date, you must receive an extension approval from the IRB.

Good luck in your research endeavors. If you have any questions or need assistance, please contact Research and Sponsored Programs at 850-857-6378 or irb@uwf.edu.

Sincerely,

Dr. Richard S. Podemski, Associate Vice President for Research And Dean of the Graduate School

Dr. Carla Thompson, Chair IRB for the Protection of Human Research Participants

CC: Byron Havard
Appendix F

IRB Data Collection Date Extension
MEMORANDUM

October 17, 2014

TO:       Ms. Marlene East
          EAST Counseling Services, Inc.

FROM:     Dr. Richard S. Podemski, Associate Vice President for Research and Dean of the Graduate School
          Dr. Carla J. Thompson, Chair, Institutional Review Board for Human Research Participant Protection

SUBJECT:  IRB Extension Approval

Thank you for keeping us apprised of the progress made on your project entitled "Mental Health Mobile Apps in Counselor Education." The IRB has approved your request to extend your data gathering through March 1, 2015.

Continued good luck in your research!
Appendix G

IRB Approval of Modifications
MEMORANDUM

November 24, 2014

TO: Marlene East
EAST Counseling Services, Inc.

FROM: Dr. Richard S. Podernski, Associate Vice President for Research &
Dean of the Graduate School

Dr. Carla J. Thompson, Chair, Institutional Review Board for Human
Research Participant Protection

SUBJECT: Approval of IRB Modification Request

Thank you for keeping us apprised of the progress made on your project titled
“Mental Health Mobile Apps in Counselor Education.” The IRB has approved
the requested amendments as outlined in your request to expand the participant
pool, reduce time commitment and increase participant compensation.

Continued good luck in your research!
Appendix H

Informed Consent
Informed Consent for 
Dissertation Research on 
Mental Health Mobile Apps in Counselor Education

Introduction
This dissertation research is on the topic of counselor education regarding an emerging technology, mental health mobile apps.

What are requirements for participation?
To participate in this section of the pilot study you:
- Must be a counselor educator in a graduate level program that trains future mental health professionals such as counselors, social workers, marriage & family therapists, psychologists, and psychologists.
- Must be willing and able to download a selected free mental health app to your phone from either the iTunes app store (Apple Devices) or the GooglePlay app store (Android devices). It is an evidence-based app designed to assist in treatment of post-traumatic stress disorder. Information for accessing the app will be provided in Section 3 of the survey.
- Must be willing to evaluate the selected app.
- Must be willing to contribute about 30-45 minutes of uninterrupted time to complete the survey.

What are possible benefits of this study?
You will receive no direct benefit from participating in this study; however, this research is important to counselor educators, counseling practitioners, counseling students, and counseling clients. This study may also assist accrediting organizations regarding technological literacy standards. In addition, developers of mental health apps may gain useful insights from this study into complex factors that contribute to use of mental health apps.

What risks are involved in this study?
Risk to participants is minimal as no treatment will be applied. Risks are no greater than risks ordinarily encountered in daily life.

Am I required to participate?
No. Participation is voluntary. Your university does not require you to participate. You may decide not to participate or to withdraw at any time without penalty or loss of benefits to which you as the research participant are otherwise entitled.

Who will know about my participation in this research study?
The principal researcher, Marlene E. East, will know the first name, last name, university, and email address of participants. The names of participants and the universities represented by participants will not be identified in any published reports or correspondences. The doctoral committee chair, Dr. Byron Havard, will have access to the records.
The data will be stored on a password protected computer in the researcher's locked personal office. A backup flash drive will be stored in a locked filing cabinet in the researcher's locked personal office. Identifiable data will be shared with no one. Data will be stored for a minimum of three years and then be erased from the computer and the flash drive. Completed paper and pencil versions of surveys will also be stored in a locked cabinet in a locked office; these will also be destroyed after three years.

Is my signature required on this Informed Consent?
No. By clicking on the links to the surveys, you are indicating you understand this informed consent and are agreeing to participate in this pilot study.

Will I be compensated for my participation in this study?
Yes, upon completion of the survey, you will be compensated with a $40.00 Amazon gift card. Participants who participate in the second qualitative phase will receive an additional $40.00 Amazon gift card.

Whom do I contact with questions about the research?
If you have questions about this study, you may contact Marlene L. East, LMHC, (850)814-3650, mle14@students.uwf.edu or Dr. Byron Havard, 850-474-2777, bhavard@uwf.edu.

Whom do I contact about my rights as a research participant?
This study has been approved by the University of West Florida Institutional Review Board (IRB) for Human Research Participants Protection. For research-related problems or questions regarding your rights as a research participant, you may contact Kristal Hall, MPH, Research Integrity Coordinator, Research and Sponsored Programs, University of West Florida. Phone: 850-857-6378 or Email: khall1@uwf.edu.
Appendix I

Permission to Use Continuum of mHealth Tools
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Wendy
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![Mobilize app screenshots](http://www.medicalapps.com/2012/05/mobilize-therapist-pocket/)

Figure 4. Mobilize app screenshots. Adapted from "Mobilize - A Therapist in your Pocket," by David C. Mehr, 2012, MedicalApps.com.

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Marlene East, LMHC, Doctoral Candidate, University of West Florida
8551-A North Lagoon Dr
Panama City, FL 32408-9710
website: www.eastcoast-counseling.com
email: mi14@students.uwf.edu or marleeneast@yahoo.com
Appendix K

Permission to Use One Love My Plan App Screenshots
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from: Jacquelyn Campbell <jcampbe1@jhu.edu>  
to: "Marlene L. East, LMHC, Doctoral Candidate" <mle14@students.uwf.edu>, Nancy Glass <nglass1@jhu.edu>  
cc: "seanna.bruno@joinonelove.org" <seanna.bruno@joinonelove.org>  
date: Mon, Mar 9, 2015 at 10:42 AM  
subject: RE: permission to use images

I am good with that but it is Dr. Glass’ call on MyPlan – she is cc’d here – can you send both of us an abstract of your dissertation please?

from: Marlene L. East, LMHC, Doctoral Candidate <mle14@students.uwf.edu>  
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Dear Dr. Campbell,

Seanna from One Love suggested I contact you for permission to reproduce images of the One Love My Plan app screenshots in my dissertation. I will be grateful for your permission.

Thanks,

Marlene East, LMHC, Doctoral Candidate, University of West Florida

Seanna Bruno <seanna.bruno@joinonelove.org>  
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Hi Marlene,

Thanks so much for your inquiry. It was great to hear from you and learn about your work. Yes, you may use the screenshots and reference One Love.

The researcher who developed the app is at Johns Hopkins and her contact information is:  
http://nursing.jhu.edu/faculty_research/faculty/faculty-directory/community-publichealth/jacquelyn-campbell

Good luck with your dissertation and the work you are doing!

Best, Seanna
From: Marlene L. East, LMHC, Doctoral Candidate [mailto:mle14@students.uwf.edu]
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Distinguished Professor and George and Boyce Billingsley Chair in Information Systems
Walton College of Business
University of Arkansas
Fayetteville, AR 72701
Phone: 479-575-3869; Fax: 479-575-3689
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