A CLOSE LOOK AT TECHNOLOGY ACCEPTANCE: A PHENOMENOLOGICAL STUDY

A Dissertation

by

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ABSTRACT

The purpose of this research study was to explore the phenomenon of public safety professionals using innovative technology in a public safety training context. A single question guided this research: *What is the experience of public safety trainees who are required to use innovative or emerging technology in face-to-face training?*

I employed a qualitative, hermeneutic phenomenological research approach to conduct this study. The approach included in-depth interviews with six public safety professionals to better understand their experience as they encountered innovative technology in training contexts. Participants were identified through purposeful sampling focusing on public safety professionals who attended training that incorporated innovative technology conducted in the United States. The primary data sources for this qualitative study were in-depth interviews with open-ended questions and supporting data from observation and documents to provide a contextual frame.

The findings of this study provided several implications to human resource development. For practitioners, the findings offer valuable information that will potentially enable effective integration of innovative technologies in training. The findings provide opportunities for researchers to explore the impact of different technologies used on trainees' technology acceptance process. Finally, the findings provide a potential to develop new theories to explain how the acceptance of innovative technology occurs.

DEDICATION

This dissertation is dedicated to three groups of people who have been at the core of my life. First, I dedicate this to my parents, Robert and Kathy Moats, who have served as examples of the best in training and educating adults and gave me my start in the field. The second group is my wife and children. Michelle, Todd, Mikayla, Calista, and Marissa have given me permission to be absent from so much while I studied, struggled, and wrote. Finally, this dissertation is dedicated to those who respond to the emergencies throughout the world. These professionals put their lives on the line every day to protect us—some for pay, some not—nevertheless, they do it all for us. To all of you, I offer my sincere and complete thanks.

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CHAPTER I

INTRODUCTION

Learning opportunities can be a transformational experience in a person's life (Cranton, 2002 ; Mezirow, 1991); however, they can also be anxiety-ridden and frustrating experiences (Schein, 1996). These experiences have the potential to sweeten or sour future learning opportunities. Therefore, the process of creating learning opportunities that reach ever increasingly diverse audiences must be undertaken with the greatest care possible.

This process involves teamwork between instructional designers, technical writers, subject matter experts, managers, and instructors. It also involves a creative blending of words, concepts, and best practices to create meaningful, productive experiences for the audience. In addition, technology can be blended into the course design to enhance the learning experience, make the learning opportunity more efficient, or even teach individuals how to use the particular technology on the job. However, the added complexity of technology comes with its own set of challenges and anxiety. The focus of this research is to study the phenomenon of technology acceptance through an exploration of individuals' experience as they use innovative technology to facilitate training.

Background of the Study

To be successful, instructors must breathe life into courses so that they engage participants, regardless of the course delivery medium (i.e., in a traditional classroom, online, or some combination) (Larsen, Sanders, Astray, & Hole, 2008). Therefore, they

must have technical knowledge and skills to operate and incorporate the technology used in the classroom (Callahan, 2010; McGurn & Prevou, 2012) and then be able to *sell* the use of that technology to participants. In addition, courses must educate, engage, and increasingly entertain the participants. In other words, courses must create a vehicle for "edutainment" (Junginger, 2008, p. 20). To accomplish this, instructional designers must develop training courses and programs that meet the needs of individuals and organizations and also engage and entertain participants (McGurn & Prevou, 2012).

Finally, innovative and emerging technology must be successfully integrated into training, despite the technological diversity of the workforce. Innovative technologies are those technologies or the *use of technologies* employed in training and "perceived as new by an individual" (Rogers, 2003, p. 12). Emerging technologies are new technologies that are employed in training. Examples of these technologies include using tablets and electronic books to replace hard copy textbooks and computer-based simulations to replicate real-world activity.

Workforce diversity may be explained on many different planes; however, an important and often-neglected measure of workforce diversity is the workforce's comfort and familiarity with innovative and emerging technologies (Prensky, 2001b, 2001c; Tapscott, 2009). Understanding the technological diversity within the workforce provides insight into understanding how individuals may react to innovative and emerging technology used in training. Therefore, this information is essential to instructional designers, managers, and instructors as they create learning opportunities.

Palfrey and Gasser (2008) provide categories to describe this digital diversity: *digital immigrants, digital natives,* and *digital settlers*. These categories are best described as digital *personalities*. Digital immigrants are hesitant adopters of the Internet and other related technologies. Digital settlers are positioned between digital immigrants and digital natives. They are identified as people who are not digital natives, but have a sophisticated use of technologies while continuing to rely heavily on other analog forms of interaction. Digital natives are people who have access to networked digital technologies, possess strong computer skills, and share a common culture that is not defined by age. Instead, the digital native status is strongly influenced by peoples' exposure and interactions with technologies, their culture, people outside of the culture, and institutions.

The determination of which category an individual fits into is related to the individual's exposure and interaction with technology. Given the ubiquitous nature and variety, as well as the overwhelming amount of technology in the United States, it is easy to see why much of the emerging U.S. workforce would be considered digital natives (Tapscott, 2009). In contrast, the established workforce is made of a potpourri of early digital natives, digital settlers, and digital immigrants. Moreover, those who choose the training format in organizations are more likely to be digital immigrants or settlers.

Not surprisingly, this diversity of training consumers creates significant dissonance. Not only is there a dissonance among those who plan and those who receive training, but there is also dissonance between the aforementioned groups of those who

receive training. In many cases, this dissonance is centered on how technology is used in training and education (Callahan & Sandlin, 2007; Gabriel, 2008; Tapscott, 2009). The outcome of this dissonance results in missed expectations and frustration. Rossett and Marshall (2010) report that "[training] opportunities are being left on the table" (p. 7) because organizations are not taking advantage of the pervasiveness of innovative technologies to enhance training. Examples of these technologies can include web-enabled smartphones, e-readers, tablets, and computer-aided simulation (to name a few). Conversely, others, such as Callahan and Sandlin (2007), suggest that technology has hindered learning and, therefore, resulted in poor performance. It is my contention that the core of this debate rests in a user's willingness to adopt an innovative technology in a training application. In other words, the issue is not *only* the appropriate use or non-use of technology in training; it is the user's *acceptance* of the technology used in training. For the purposes of this study, the terms technology acceptance and adoption are interchangeable and refer to an individual deciding to use a technology to the fullest extent possible within the given application (Rogers, 2003).

A key question for the training development team is: If organizations incorporate innovative technology into training opportunities but learners reject the technology, has the organization succeeded in developing effective training? I suggest the answer is no and that the organization has failed to effectively meet the needs of the user. Ultimately, organizations could become irrelevant if they fail to develop training that meets the needs and expectations of the learners (Tapscott, 2009). Palfrey and Gasser (2008) capture the essence of the dilemma very succinctly, "…we are at a crossroads. There are

two possible paths before us – one in which we destroy what is great…and one in which we make smart choices and head toward a bright future…"(p. 7)(p. 7).

The Problem

Challenges exist to creating effective training courses and programs. First, employers and employees often exhibit negative attitudes toward employee training (Panagiotakopoulos, 2011). This may be due to many participants' fear of performing poorly in training or a lack of self-confidence in their performance during training (Holley & Dobson, 2008). Another challenge exists because of limits placed on employees' available time and accessibility to training resources (Callahan & Sandlin, 2007; Lyons & Mattare, 2011; Panagiotakopoulos, 2011). For example, when organizations face an economic crisis, the time that would be available for training is sacrificed for productivity. This is very apparent in municipal governments that are reducing funding to fire, law enforcement, public works, and other public service agencies (Greenstone & Looney, 2011; Johnson, Oliff, & Williams, 2011; Shannon, 2011). Complicating the accessibility issue, many government agencies are limited by travel restrictions, which allow personnel to attend training delivered only within their city or neighboring cities. Consequently, agencies must rely on internal and grant-funded training to provide the bulk of their training. In other cases, agencies are simply doing without training.

The cost of developing, delivering, and maintaining training is another significant challenge faced by organizations (Callahan & Sandlin, 2007; Panagiotakopoulos, 2011). The current economic crisis has created financial challenges

for many organizations, regardless of their size. The net result is that most organizations are forced to do more with less, as illustrated with the release of the 2010 U.S. Gross Domestic Product (GDP), which showed a 2.5% increase while the unemployment rate hovered at nearly the highest rate in more than a decade (BEA, 2011).

Because of these and other challenges, organizations are constantly seeking efficiencies that increase the accessibility to training while reducing its cost. Innovative technologies can provide these efficiencies. For example, the use of web-based and Web 2.0 technology-based learning applications enable the wide-spread reusability and accessibility of the training, in both temporal and geographical terms (ASTD, 2010). The result is a single input with multiple, reusable outputs that can be accessed nearly anywhere there is a computer and an Internet or wireless connection; however, Rossett and Marshall (2010) maintain that organizations are not fully taking advantage of the pervasiveness of innovative technologies to enhance training. At the end of their analysis, the authors ask, "Should we lament that the habits identified in this study are not much different in 2009 than they were in 1989 (although, of course, enabled by technology)?" (Rossett & Marshall, 2010, p. 38).

Innovative and Emerging Technology

Technology constantly emerges and inspires innovation (Rogers, 2003). Moreover, the use of innovative and emerging technology has revolutionized education (Frey & Faul, 2005), and by extension, training and development. Technological innovations, from books to the slate blackboard, erasable white boards to tablet computers, computer-based learning management systems to high fidelity simulations,

and Facebook to Twitter, have significantly impacted the ability and capacity to conduct effective training (McWhorter, 2010). Innovative technology is defined as technology that is innovative or used in an innovative method. Emerging technology is defined as a technology that is new or cutting edge; it is emerging in the marketplace. The term *innovative technology* will be used throughout the rest of this manuscript to indicate both innovative and emerging technology.

Many trainees readily accept the technological advancements and innovation; however, sometimes trainees choose to reject the technology used to facilitate training, likely because the benefits of learning to use the technology are not readily apparent (F. D. Davis, 1986, 1989; F. D. Davis, Bagozzi, & Warshaw, 1989; Venkatesh, Morris, Davis, & Davis, 2003). Rogers's (2003) monograph, *Diffusion of Innovations*, provides a basis for defining the concept of technology acceptance. Rogers (2003) explains that when an individual encounters an innovation, he or she must ultimately make a decision on whether to adopt (i.e., accept) or reject the innovation. In some cases, this decision can be influenced by the social structure. In nearly all cases, there is a period of time that must pass while the individual (or organization) works through the acceptance process. As stated previously, technology acceptance means that an individual decides to use a technology to the fullest extent possible within the given application (Rogers, 2003). The focus of this research study is the exploration of public safety professionals' experiences when faced with innovative technology in a training context.

As technology grows more sophisticated, it continues to provide more value and create opportunities for innovation in many arenas, including training (McWhorter,

2010). Yet, people base their decisions to adopt technology on a combination of factors including (a) availability and access (Callahan & Sandlin, 2007), (b) the users' perception of the appropriate use of a technology (Tapscott, 2009), (c) the perceived utility of the technology (F. D. Davis, 1986, 1989; F. D. Davis et al., 1989; Venkatesh et al., 2003), (d) the ease of use of the technology (F. D. Davis, 1989), and (e) the individual's *self-efficacy*, or his or her perception of how well he or she will be able to perform in a given situation (Bandura, 1982). In other words, individuals want some assurance that the investment they make in learning to use technology will have a return in training and/or job performance.

Current research on the concept of technology acceptance addresses college and university faculty accepting and using technology to teach college courses (Ahmad, Madarsha, Zainuddin, Ismail, & Nordin, 2010; Frey & Faul, 2005), university students adopting technology (Jonas & Norman, 2011; Liu, Chen, Sun, Wible, & Kuo, 2010), and workers accepting technology used in the performance of their jobs (Yen, Wu, Cheng, & Huang, 2010). Researchers have also examined the antecedents of technology acceptance (F. D. Davis, 1986, 1989; Y. Lee, Kozar, & Larsen, 2003; Salmon, 2009; Venkatesh et al., 2003).

However, there are voids in the research. Little if any available research addresses the acceptance of technology used in training. Also, little if any research has explored the aforementioned dissonance between the emerging and established workforce. A review of available literature failed to produce studies that explore the experiences of individuals who encounter innovative technology in a training context.

Studies that examine the experiences of training managers as they encounter and choose technology to incorporate into training applications are also absent from the literature. Prensky (2001c) asserts that these managers are typically digital immigrants and settlers and are not as comfortable with incorporating the innovative technology into training; moreover, they may see technology as a luxury, distraction, or frivolity (Oblinger, 2003; Prensky, 2001b, 2006).

Research shows that digital natives are very different from any other era of worker (Oblinger, 2003). Researchers think that a significant reason for this difference involves the individual's exposure to technology such as computers, video games, and the Internet (Palfrey & Gasser, 2008; Prensky, 2001a, 2001c; Tapscott, 2009). Tapscott (2009) writes the following about digital natives, the group he labels the *Internet Generation* or *Net Geners*:

> Net Gen kids looked at computers in the same way boomers look at TV. Boomers don't marvel at the technology or wonder how television transfers audio and video through thin air…TV is a fact of life. So it has been with Net Geners and computers. And as technology relentlessly advances each month, young people just breathe it in... (p. 19) (p. 19)

Given this, the digital native expects to see innovative technology used in every facet of life, including training; however, the literature has failed to produce any perspectives that explore the experiences of digital natives as they come to these technology acceptance decision points.

While the dissonance between learners is intriguing, it is also troubling for learners and organizations alike. Technology has and continues to change the world that we live in and how we live in it (Alexander, 2009; Friedman, 2005; Kirriemuir, 2008; Salmon, 2009). Likewise, technology and the individual's exposure to it are changing the training needs and expectations of the workforce (Palfrey & Gasser, 2008; Prensky, 2001a, 2001b, 2001c; Smart, Cascio, & Paffendorf, 2007; Tapscott, 2009). Therefore, this research study is focused on understanding the phenomenon of individuals' experience using innovative technology in a training context. Specifically, this study explores the experiences of public safety professionals using innovative technology in a public safety training context. In this study, the innovative technology refers to either a computer-based, scenario-driven simulation or an e-Publication with an iPad used as an e-Reader.

Purpose and Research Question

The challenges of making Palfrey and Gasser's (2008) *smart choices* and keeping pace with the trainees' expectations presents serious challenges to training providers. But without a better understanding of how and why learners accept technology, training design and implementation decisions are likely to continue on divergent paths from the learners' needs (McGurn & Prevou, 2012). Swanson (as cited in Dooley & Lynham, 2003) suggests that to improve performance, instructional designers and training managers must first understand the learners' *lived experiences* as they encounter innovative technology. In doing this, these training professionals are presented with opportunities to better understand the learners' perspectives and make informed

decisions about how to incorporate innovative technology to facilitate training in order to foster its acceptance by the learners.

Therefore, the purpose of this research study was to explore the experience of public safety professionals to better understand their experiences as they use innovative technology in a public safety training context. This research study is based on a single question: *What is the experience of public safety trainees who are required to use innovative or emerging technology in face-to-face training?*

Theoretical Context

Four theories provide a theoretical context to this study: (a) Venkatesh, Morris, Davis, and Davis's (2003) Unified Theory of the Acceptance and Use of Technology (UTAUT), (b) Lewin's (1997) change model and Schein's (1996) model of managed learning; (c) Rogers's (2003) diffusion of innovations, and (d) Carlson's (1995) channel expansion theory.

Unified Theory of the Acceptance and Use of Technology (UTAUT)

UTAUT (Venkatesh et al., 2003) was created to explain an individual's decision to accept and use technology in a unified way. This specific theory was derived through a comparison and analysis of eight theoretical models of user acceptance of technology. The basis for UTAUT was among these eight models and theories. Although these various models have roots in systems, psychology, and sociology, each model has a similar underlying conceptual framework for the process.

Each model presents a range of determinants numbering as few as two and as many as seven (Venkatesh et al., 2003). As a result of the comparison of the eight

models, the authors theorized four primary constructs that are determinants of technology acceptance: (a) performance expectancy or "the degree to which an individual believes that using the system will help him or her to attain gains in job performance," (Venkatesh et al., 2003, p. 447); (b) effort expectancy or "the degree of ease associated with the use of the system," (Venkatesh et al., 2003, p. 450); (c) social influence or "the degree to which an individual perceives that important others believe he or she should use the new system," (Venkatesh et al., 2003, p. 451); and (d) facilitating conditions or "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system," (Venkatesh et al., 2003, p. 453).

Although the various theories and models had a foundation in diverse schools of thought such as systems, psychology, and sociology, all have been shown to have a similar underlying conceptual framework that unfolds in three steps: (1) An individual encounters a technology and reacts to using it, (2) the user then expresses an intention to use the technology, and (3) then the user actually uses the technology.

UTAUT and many of its underlying models and theories examined technology acceptance from a predictive standpoint. This means that the research supporting UTAUT examined only the determinants of technology acceptance. Consequently, these theories and models failed to examine technology acceptance from an experiential perspective. In other words, these theories and models failed to incorporate the richness and depth of the user's experiences of technology acceptance.

Change Model and Model of Managed Learning

Lewin (1997) provided one of the earliest models of planned change. His model presented change in three steps: (1) unfreezing, (2) moving, and (3) refreezing. Lewin viewed change as a modification in competing forces that hold a system's behavior stable (Cummings & Worley, 2005). These forces fall into two general categories: restraining forces that desire to maintain the status quo and driving forces that desire change. Schein (1996) adapted Lewin's model to begin explaining managed learning. Schein expounded on Lewin's three-step process by explaining that the unfreezing begins when individuals encounter disconfirming data that challenges their beliefs and creates dissatisfaction. At this point, individuals put up defenses against change. An important concept from Schein (1996) is "learning anxiety" (p. 29). This anxiety is a restraining force that occurs when a learner encounters valid and relevant data that challenges what was once held to be true. It originates from a sense or threat of loss. Individuals must overcome the learning anxiety to advance to the next step of change, moving.

Schein (1996) suggests that the move stage is defined by a "cognitive redefinition" (p. 30) in which words take on a different meaning, the conceptual interpretations are broadened, and the scale of judgment shifts. This redefinition process concludes through one of two mechanisms: "(1) learning through positive or defensive identification with some available positive or negative role model or (2) learning through a trial-and-error process based on scanning the environment for new concepts" (Schein, 1996). As the new concepts are accepted, the refreezing occurs. Both Lewin's (1997)

change model and Schein's (1996) adaptation inform the conceptual framework that guided this study.

Diffusion of Innovations

Rogers's (2003) diffusion of innovation is the seminal work on how innovations are adopted in a social system over time. Rogers first published his book more than five decades ago to explain how agricultural innovations were adopted based on his research of Ohio farmers. Over the last five decades the diffusion of innovations has been applied to many fields, including health, technology, and education.

Rogers (2003) defines diffusion as "a process by which an innovation is communicated through certain channels over time among members of a social system" (p.11). Rogers (2003) defines an innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 12). The focus of this study was not limited to the acceptance of any technology. In fact, this study was interested in how *innovative* technology with a specific application—supporting the delivery of training—was accepted by trainees.

One of the most powerful contributions of this work is the innovation-decision process. This five-step model attempts to explain how individuals pass from getting information to making a decision about using an innovation. Through this process, an individual passes through a "series of choices and actions over time" (Rogers, 2003, p. 168) toward making a decision to accept or reject the innovation. Understanding a process of how innovations are communicated throughout a social system helps inform this study.

Channel Expansion Theory

Channel expansion theory (Carlson, 1995; Carlson & Zmud, 1999) arose in response to the inadequacies of other theories to explain how individuals chose communication channels, particularly technology channels. This theory compliments the diffusion of innovations by explaining how communications channels within a social system are chosen. This theory suggests that users are able to expand the richness of a channel by increasing familiarity with the channel (Carlson, 1995), lending credence to the suggestion that the more experience an individual has with a particular channel (i.e., technology), the more likely he or she is to use (i.e., accept) the channel. From this, it is reasonable to extrapolate that the more experience an individual has with a technology, the more likely he or she is to accept the technology.

Significance of the Study

A review of the extant literature reveals that research on the topic of technology acceptance has explored the probable conditions for individuals accepting technology from a quantitative approach. Additionally, this research has provided a basic sequence of acceptance. Yet, the extant research fails to provide a qualitative approach to explore the rich descriptions of individuals' experiences as they use innovative technology.

Similarly, the extant literature concerning change explains a process of change, including change through learning. However, change is rarely mentioned in technology acceptance and the impact of the complexities of technology are rarely mentioned in change literature. Moreover, the diffusion of innovation literature explains how

innovation is diffused throughout an organization and even a culture. Yet, the literature does not clearly discuss how individuals adopt innovation.

This study provides both practical and theoretical contributions to the field of human resource development by exploring the lived experiences of public safety professionals as they use innovative technology in a public safety training context. This information is valuable to the instructors and designers of training who must incorporate technology into training applications; this information will also better inform the training managers who assess the value and choose training for diverse audiences.

With regard to the theoretical significance, this study adds to the understanding of the underpinnings of technology acceptance, which is likely the instructional design employed to create the training course and change. The focus on the trainees' experience from an interpreter's perspective, regardless of their position within the digital diversity, fills a gap in the extant literature.

The practical significance of this study lies within the information provided to instructional designers and instructors. This information gives them more information about how to properly incorporate and sell technology used within training applications. In other words, the information can provide those responsible for designing and delivering training the knowledge needed to more effectively incorporate technology into training applications. Ultimately, this knowledge can improve the design of training and the learners' acceptance of technology. This knowledge may also provide the keys that begin to bridge the gap between digital immigrants, digital settlers, and digital natives.

Boundary of the Study

All research is limited by a multitude of factors. This study is bounded to selected participants in courses delivered by one organization due to constraints in time, financial resources, and access to organizations using innovative technologies in training public safety personnel. The selection of both the research site and participants represents a method of purposeful sampling (Creswell, 2007; Merriam, 1998; Patton, 2002). The participants in this study were public safety trainees and the organization under investigation was a training organization for public safety employees. Given the convenience of access, I selected the largest public safety training organization in the United States. Participant selection is also based on predetermined criteria, which are discussed in Chapter III. As I previously stated, my intent was to develop an in-depth understanding of public safety trainees' experiences as they were confronted with innovative technology. As such, any generalization of this study's findings should be done with caution. Finally, in qualitative research, the researcher is the instrument. As that instrument, I brought my own set of assumptions to this study.

Definitions

- **Digital native:**

  A person born into the digital age (after 1980) who has access to networked digital technologies and strong computer skills and knowledge. Digital natives share a common global culture that is defined not strictly by age but by certain attributes and experiences related to how they interact with information technologies, information itself, one

another, and other people and institutions. (Palfrey & Gasser, 2008, p. 346)

- A **digital immigrant** is "[a] person who has adopted the internet and related technologies, but who was born prior to the advent of the digital age" (Palfrey & Gasser, 2008, p. 346)
- An **electronic publication (e-pub)** is an electronic file of a publication
- An **electronic reader (e-reader)** is a handheld electronic device that is used to display an electronic publication (e-pub).
- **Emerging technology** is a technology that is new or cutting edge; it is emerging in the marketplace.
- **Innovation** is "[a]n idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 474). The *newness* of an innovation is relative. It does not have to be a completely new knowledge. Innovation can include knowledge that is forgotten or known for some time. As Rogers (2003) states, "If an idea is new to the individual, it is an innovation" (p. 12).
- **Innovative technology** is technology that is innovative or used in an innovative method.
- **Learning** is "a process of constructing meaning; how people make sense of their experience" (Merriam & Caffarella, 1999, p. 261).
- **Public safety professionals** are professionals in a broad category that are often referred to as emergency responders and include: firefighters, police officers,

paramedics, emergency managers, and others that are often sent into ill-defined crisis situations with the expectation that they will solve the complex and overlapping problems created by a crisis (Ford & Schmidt, 2000).

- **Simulation** is "a production of visual images of objectives and scenes, usually under real-time conditions, when the original object or scene is not available" (Welford, 1977, p. 784).
- **Training** is a deliberate and planned effort to develop an employee's knowledge, skills, and abilities to do a specific job (Noe, 2003).

Organization of the Dissertation

This dissertation contains five chapters. Chapter I introduces the topic, identifies the problem, describes the significance of the study, and presents the conceptual and theoretical frameworks for the study. Chapter II explicates the context for the study (public safety training) and reviews extant literature relevant to the research topic, including technology acceptance, change, and digital personality theories that informed this study: Venkatesh, et al.'s (2003) UTAUT, Lewin's (1997, 1952) change theory, Schein's (1996) adaptation of Lewin's change theory, Rogers's (2003) diffusion of innovations, and Carlson's (1995) channel expansion theory. Chapter III describes the research methodology used for the study, including the research design, participant selection, data collection, and data analysis procedures. Chapter IV reports the findings of the study. Chapter V discusses significant findings in relation to extant literature, draws conclusions based on the findings, and offers recommendations for future practice and research.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to provide a preliminary review of the literature related to public safety professionals' use of innovative technology in a training context. This chapter is organized into four sections. The first section describes the public safety training that serves as the context for this study. The second section provides an overview of the literature concerning technology acceptance. The third section offers a review of change literature to provide the theoretical frameworks for this study from five perspectives: Schein's interpretation of Lewin's change theory as it relates to learning, Rogers's diffusion of innovations, and Carlson's channel expansion theory (see Figure 1). The fourth section reviews literature concerning the digital personalities of individuals. Figure 1 is a graphic representation of the theoretical influences to this study. As it shows, each theory discussed in this chapter, as weighed over the context of public safety training, contributed to the purpose of this study.

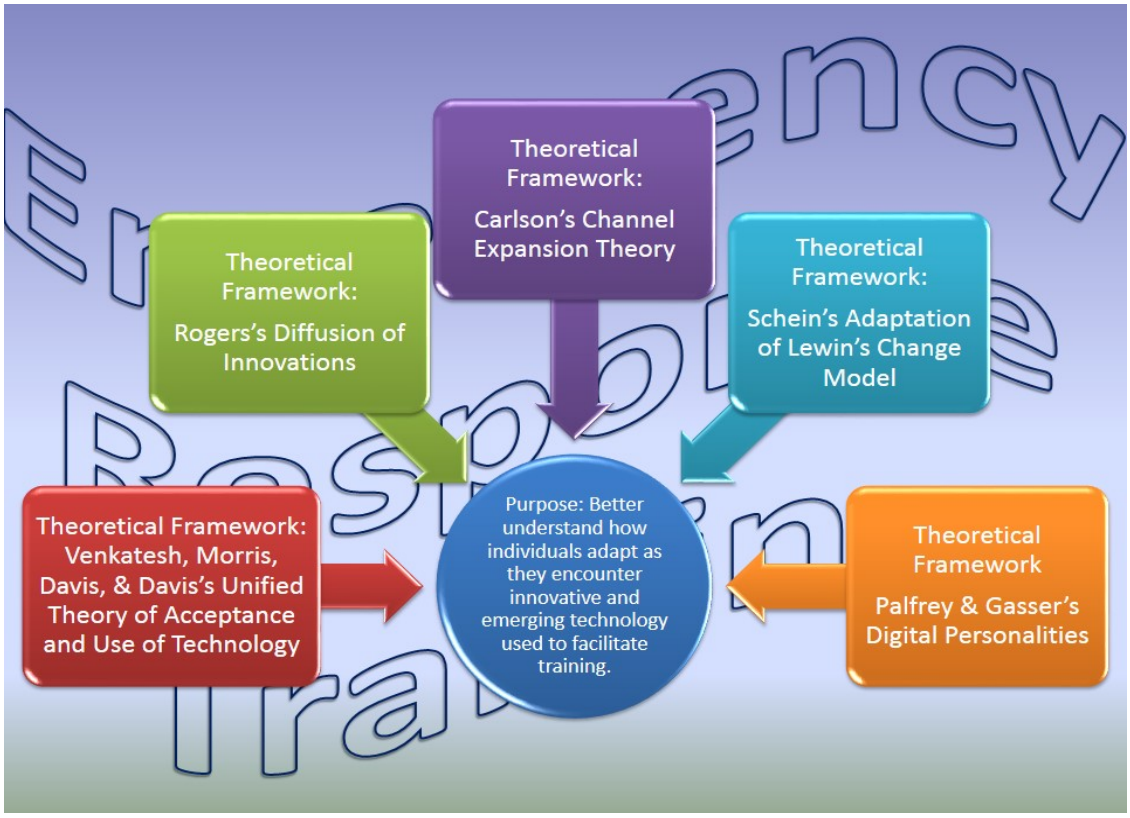

Figure 1. Theoretical framework for the study

Public Safety Training

This section discusses the context of this study: public safety training. The section begins with a definition of training and follows with a discussion of who public safety professionals are. It concludes with the performance levels and a discussion of the content of public safety training.

Training

The literature is rife with discussions and debates that attempt to differentiate between training and education (Merriam & Caffarella, 1999; This & Lippitt, 1979). Nevertheless, training, at its core, is a learning opportunity. Training, through planned

learning opportunities, allows for the identification, assessment, and development of the individuals to perform a current or future job (Fitzgerald, 1992; McLagan, 1989; Noe, 2003). The implication from this definition is that trainees "are to master knowledge or skills and apply these skills to everyday activities" (Stabile & Ritchie, 2013, p. 73).

J. R. Davis and Davis (1998) provide this explanation to help better understand training:

> Training is necessary to help workers qualify for a job, do the job, or advance, but it is also essential for enhancing and transforming the job, so that the job actually adds value to the enterprise. Training facilitates learning, but learning is not only a formal activity designed and encouraged by specially prepared trainers to generate specific performance improvements. Learning is also a more universal activity, designed to increase capability and capacity and is facilitated formally and informally by many types of people at different levels of the organization. Training should always hold forth the promise of maximizing learning. (p. 44)

Training is an essential activity to keeping any organization competitive. Developing the workforce of an organization provides obvious benefits that result in improved efficiency. Given the challenges that companies and organizations face, they cannot afford to ignore the benefits that training offers. Yet, Salas, Tannenbaum, Kraiger, and Smith-Jentsch (2012) provide an eloquent description of the changing landscape faced by corporations and governments:

> …a few common trends include dealing with an aging and, in many cases, crosscultural workforce; the retraining of displaced personnel; a new generation entering the workforce with different motivations, expectations, and approaches to learning; access to rapidly emerging technologies that can accelerate or distract from employee development; and the need to develop an adaptive, flexible workforce that can adjust to changes, while simultaneously ensuring that employees have the specific skills they need to do today's work. (p. 75)

Training is the process of properly and effectively equipping individuals to perform their jobs, whether current or future. Both planned (Fitzgerald, 1992; McLagan, 1989; Salas et al., 2012; This & Lippitt, 1979) and/or unplanned (Marsick & Watkins, 1997) learning efforts can be used to accomplish training and involve work-related or more general knowledge that can later be applied to a new job. Salas et al. (2012) suggest that "the goal of training is to create sustainable changes in behavior and cognition so that individuals possess the competencies they need to perform a job" (p. 77). Competencies are used to define performance in terms of knowledge, skills, and attitudes and are measured in small increments for training purposes (Chandler, Qureshi, Gebbie, & Morse, 2008). Training and development can also be a short duration activity, but may include life-long learning activities. Training has been used to increase performance and accuracy in high-risk settings, such as the ones faced by emergency responders (Salas et al., 2012).

Channing R. Dooley is credited with making the distinction between training and education that began to emerge in the 20th century He suggested that education was

used to prepare one for life with broad and general knowledge, while training was specific, typically tied to solving production problems and acquiring skills (Dooley, 1945). Since the mid-1940s, training has manifested itself in companies through corporate employee training programs, as well as federal and state training programs. Training has been elevated from being a luxury to being an essential strategy to ensure that companies maintain their competitive edge (McLagan, 1989; Noe, 2003). Despite the advancements in training, research and theoretical development lagged far behind other areas up through the 1990s (Kraiger, Ford, & Salas, 1993).

Nationally, the training industry is a $135 billion dollar industry (Salas et al., 2012). The training field continues to grow, becoming more sophisticated (Salas & Cannon-Bowers, 2001). Specifically, in fiscal year 2012, the United States Congress budgeted more than $521 million for the Federal Emergency Management Agency (FEMA) dedicated to training emergency responders. This amount equates to approximately 1.15% of the entire U.S. Department of Homeland Security's (DHS) annual budget (Appropriations, 2012). This significant investment of financial resources, time, and effort signifies the importance of training to enhance the capabilities of public safety professionals in the nation.

Training methods and instructional strategies have grown as well. These methods and strategies have continually incorporated and integrated innovative technologies, from the use of overhead projectors in the 1940s and 1950s to the use of blended learning and computer-supported simulations in the new millennium (Chandler et al., 2008; Salas & Cannon-Bowers, 2001). Researchers are continually seeking the

best methods and strategies to present training (Salas & Cannon-Bowers, 2001). What is known about training is that the design, delivery method, and implementation has a major impact on its effectiveness, and when training is properly designed, it works (Salas et al., 2012).

Public Safety Professionals

Public safety covers a broad category of disciplines concerned with preventing and mitigating hazards that could endanger the public as well as responding to and recovering from emergency incidents when they occur. This category includes those disciplines that are often referred to as emergency responders and includes firefighters, police officers, paramedics, emergency managers, and others who are often sent into ill-defined crisis situations with the expectation that they will solve the complex and overlapping problems created by a crisis (Ford & Schmidt, 2000). While definitions abound in the literature, public safety professionals, as emergency responders, are often defined in general terms as those "who directly respond to a disaster" (Lindell, Prater, & Perry, 2007, p. 466). In the context of the United States, where this study takes place, public safety professionals, as emergency responders, are defined by a presidential directive as:

> Those individuals who in the early stages of an incident are responsible for the protection and preservation of life, property, evidence, and the environment, including emergency response providers as defined in section 2 of the Homeland Security Act of 2002 (6 U.S.C. 101), as well as emergency management, public health, clinical care, public works, and other skilled support personnel (such as

equipment operators) that provide immediate support services during prevention, response, and recovery operations. (Bush, 2003, p. 2)

These professionals represent ten disciplines: fire service, law enforcement, Emergency Medical Services (EMS), hazardous materials response, public safety communications, public health, health care, emergency management agency, public works, and governmental administrative (FEMA, 2013b). Table 1 provides a brief description of each discipline.

Table 1

Emergency Responder Disciplines and Descriptions

Discipline	Description
Fire service	Provide life safety services including fire suppression, rescue, arson investigations, public education, and fire prevention training (FEMA, 2013b)
Law enforcement	Provide law enforcement services intended to deter or discover criminal activity at the local, state, and federal levels (Hess & Orthmann, 2012)
EMS	Provide prehospital care and transportation to injured and ill people
Hazardous materials response personnel	Provide the identification for, assess the risk of, and mitigate or control the release of hazardous materials (FEMA, 2013b)
Public safety communications	Provide a means to connect persons reporting an incident and response personnel, as well as a means for responders to communicate with other response personnel during an incident (FEMA, 2013b)
Public health	Provide protection against environmental hazards, promote healthy behaviors, respond to disasters, and ensure the quality and accessibility of health services (FEMA, 2013b)

Table 1

Continued

Discipline	Description
Health care	Provide clinical, ancillary, forensic, and administrative skills in hospitals, clinics, and other facilities offering medical care (includes medical surveillance, mental health care, epidemiological investigation, diagnosis, treatment, and fatality management) (FEMA, 2013b)
Emergency management agency	Provide the application of science, technology, planning and management at the local, state, and federal levels to coordinate preparation, recognition, response, and recovery efforts from large-scale disasters and catastrophes (FEMA, 2013b; Lindell et al., 2007)
Public works	Provide administrative, technical, supervisory, and craft roles that make up the construction and management of the nation's infrastructure (FEMA, 2013b)
Governmental administration	Consist of elected and appointed officials at the local, state, and federal levels (FEMA, 2013b).

Each of the disciplines is expected to keep personnel trained for a variety of emergencies and disasters that may occur within a local community, including those that could have regional, national, and even international implications and consequences. This approach, called all-hazards, was initiated after analyses of the preparedness and response efforts to the 1995 terrorist bombing in Oklahoma City, Oklahoma (G. Commission, 1999); the September 11, 2001, terrorist attacks (Prieto, 2006); and the 2005 hurricane season (Congress, 2006; Townsend, 2006). As a result of these and other significant disasters in the United States, the emergency response disciplines underwent a paradigm change in which they could no longer be stove-piped and must be interoperable and, in the best sense of the word, interdisciplinary (Bellavita, 2006; The

9/11 Commission, 2004). To reinforce this paradigm of interdisciplinary cooperation, emergency response teams have been established across the United States. These teams not only have the obvious capability to respond to a disaster, but they typically have training and exercise capabilities and missions as well (Ford & Schmidt, 2000). Much of the training used to prepare these public safety professionals is intended to enhance the knowledge, skills, and abilities of these personnel to be better decision makers (Klein, 1999; Lindell et al., 2007; Montgomery, Lipschitz, & Brehmer, 2005). To meet this intent, public safety professionals must "participate in intensive training sessions and exercises to prepare them for their tasks" (Moats, Chermack, & Dooley, 2008, p. 398). In addition to the new interdisciplinary aspects of emergency response communities, public safety professionals have seen their roles expanded as the needs of their constituent communities have evolved in the wake of major disasters (Chandler et al., 2008).

Types of Public Safety Training

The DHS funding is used to provide public safety professionals a wide variety of training. Therefore, it is useful to understand how emergency response training has evolved. For many decades, emergency responder training was accomplished by way of on-the-job training. Some departments developed recruit academies and organized training divisions, but standardized training on a national level was largely absent until the mid-1990s. In the aftermath of the 1995 bombing, the events of September 11, 2001, and Hurricane Katrina, much of the training for public safety professionals provided by the Federal Government was reorganized under an organization within DHS called the

National Training and Exercise Directorate (NTED) (FEMA, 2013b). The mission of the NTED is:

> to make high-quality training available to the first responder community, tailored to enhance the capacity of states and local jurisdictions to prepare for, prevent, deter, and respond and recover safely and effectively from potential manmade and natural catastrophic events, including terrorism. (FEMA, 2013b, p. xi)

The underlying current of this organization is to make standardized training available to emergency response organizations at various levels of performance. The levels of training include awareness-level training, which is designed for those public safety professionals who will only "recognize and report a potential catastrophic incident" (FEMA, 2013a). Performance-level training is intended to prepare those public safety professionals "who perform tasks during the initial response to a catastrophic event" (FEMA, 2013a). The third performance level of training, management and planning, is intended to prepare those public safety professionals with the highest level of responsibility in an incident response. These personnel typically "build plans and coordinate the response to a mass consequence, manmade, or natural event" (FEMA, 2013a).

Technology Used in Public Safety Training

The paradigm of modern training is quickly dissolving. Technology (Alexander, 2009; Friedman, 2005; Kirriemuir, 2008; Salmon, 2009) and the learning styles and preferences of the emerging workforce are rapidly changing around the world (Palfrey & Gasser, 2008; Prensky, 2001a, 2001b, 2001c; Smart et al., 2007; Tapscott, 2009).

Despite the emphasis on training, there is little evidence to suggest that training organizations are adapting course designs to address these changes (Oblinger, 2003; Prensky, 2006), especially those organizations that train emergency services workers (Junginger, 2008). Although the training design is not changing, the technology used in training public safety professionals is diverse. For the purposes of this study, I have focused on two technologies that are used in training: (a) e-readers and e-pubs and (b) simulations.

Electronic readers (e-reader) and electronic publications (e-pub). An e-reader is a handheld electronic device used to display an e-pub. While there are several e-readers on the market, the e-readers share common features, including the ability to display and navigate through e-pubs. Many e-readers are multifunction tablet-like computers that have capabilities to navigate the Internet. For example, the iPad, which is used in one of the two courses in this study, has the ability to run apps, or individualized computer programs that typically use the Internet 2.0.

E-pubs are, as the name implies, an electronic file that contains a publication. These file formats are often proprietary in nature and do not conform to a single standard. While there is an emerging standardized format created by the International Digital Publishing Forum (IDPF), most e-readers are not able to read competitor's formats (Dougherty, 2010).

E-pubs and e-readers are becoming popular with training organizations and managers because they reduce the cost of training by allowing rapid changing to training materials and eliminating the cost of printing manuals. Some training participants enjoy

these e-readers and e-pubs because it allows for greater portability of the course materials. Another of the benefits of an e-reader is that it is capable of carrying multiple e-pubs, in many case thousands. If these thousands of publications were carried in hard copy format, they would completely fill a small library and weigh several tons.

Simulations. For the purposes of this study, a simulation is "a production of visual images of objectives and scenes, usually under real-time conditions, when the original object or scene is not available" (Welford, 1977, p. 784). The fidelity, or ability of the simulation to accurately reproduce the effect, ranges from low to high; in other words, the higher the fidelity of the simulation, the more accurately the simulation portrays the original object.

Public safety training uses a wide variety of simulations, ranging from colored rags to represent smoke and fire, to high fidelity computer-supported simulations such as E-Semble's XVR and the Texas A&M Engineering Experimentation Station's Emergency Management Exercise System (EM*ES). The situational context that these simulations provide, regardless of the fidelity, are paramount to the experiential learning opportunities public safety professional need to develop. These situational contexts provide public safety professionals the ability to develop decision-making skills in a myriad of applications, including tactical and strategic management of emergency situations, leadership, and crisis communications (Crandall, Klein, & Hoffman, 2006; Klein, 1993, 1997, 1998; Klein & Weitzenfeld, 1979; Zsambok & Klein, 1997).

Technology Acceptance

Technology is ubiquitous in our lives. Although the integration and use of technology is often intended to make the tasks of life easier and more efficient, it can also lead to frustration, embarrassment, and even anger. The successful use of technology requires that individuals must at least partially accept technology; however, in training applications, technology acceptance is not the sole responsibility of the learner. To be successful, "instructors, curriculum developers, and QA/QC personnel will all need the skills to design a learning environment that facilitates learning and then apply different instructional strategies" (McGurn & Prevou, 2012, p. 1533). This section provides an overview of the literature concerning technology acceptance starting with Ajzen's and Fishbein's (1980) theory of reasoned action and then progresses to the technology acceptance model that stemmed from Davis's (1986) doctoral dissertation. This review culminates in a review of UTAUT.

As I explained in Chapter I, technology acceptance is the individual's decision to embrace technology for a given application. Significant research on the concept of technology acceptance exists in the literature; however, there are two important gaps. First, there are few, if any, studies that address the acceptance of technology that is used to facilitate training. Second, the preponderance of the existing literature addresses the topic from a quantitative perspective, excluding much of the depth and richness of the phenomena that qualitative studies provide. In this section I will discuss the existing technology acceptance literature beginning with the Theory of Reasoned Action (TRA)

(Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and culminating with UTAUT (Venkatesh et al., 2003).

Theory of Reasoned Action (TRA)

TRA (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) provides the backdrop for the present technology acceptance studies, including the Technology Acceptance Model (TAM) (F. D. Davis, 1986) and UTAUT (Venkatesh et al., 2003). TRA states that the two typical determinants of an individual's behavioral intention are attitude and the subjective norm (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975; Y.-H. Lee, Hsieh, & Ma, 2011; Yousafzai, Foxall, & Pallister, 2007). Moreover, TRA suggests that a person's stated intention to take an action is the most immediate predictor of that action (Ajzen & Fishbein, 1980; Hagger, Chatzisrantis, & Biddle, 2002). The theory also purports that the subjective norm is heavily influenced by the individual's perception of those who are important or significant to the decision maker and those persons' desire to have the individual participate in the intended behavior (Fishbein & Ajzen, 1975; Hagger et al., 2002). In other words, TRA suggests that a person's decision to act is heavily influenced by the opinions and/or desires of those with significant influence over him or her.

Technology Acceptance Model (TAM)

The TAM (F. D. Davis, 1986) is the most widely used and studied theory of technology acceptance (Y.-H. Lee et al., 2011; Y. Lee et al., 2003). The TAM was created through an adaptation of TRA (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) "to explain computer usage behavior" (F. D. Davis et al., 1989, p. 983). The

TAM connects the dots for "the causal relationship between users' internal beliefs, attitude, intentions, and computer usage behavior" (Yousafzai et al., 2007, p. 251). The results of these connections indicate that technology acceptance is determined through two primary variables: (a) perceived use and (b) perceived ease of use (F. D. Davis, 1986; F. D. Davis et al., 1989).

Since its first publication in 1986, the TAM has been used to explore the acceptance of numerous technologies, including word processors, communications systems, office systems, and specialized business systems (Y. Lee et al., 2003; Yen et al., 2010); wireless technology (Yen et al., 2010); e-learning systems (Y.-H. Lee et al., 2011); and online communities (Chung, Park, Wang, Fulk, & McLaughlin, 2010). In addition, researchers have used the TAM to explore the technology acceptance of students in educational institutions (Jonas & Norman, 2011; Y.-H. Lee et al., 2011; Liu et al., 2010). According to Yousafzai et al. (2007) "replication of the original TAM study suggests that it holds across persons, setting, cultures, countries and times" (p. 264).

Existing technology acceptance literature indicates that individuals are most likely to accept technology when three general criteria are met: (a) the utility of the technology is understood to help the individual do his or her job better, (b) the outcome of learning to use the technology is worth the effort, and (c) the individual can see himself or herself using the technology (F. D. Davis, 1986, 1989; F. D. Davis et al., 1989; Venkatesh et al., 2003). Ultimately, technology acceptance boils down to an individual's decision. Klein (1998) suggests that decisions are based on the individual's

"use of experience to recognize key patterns that indicate the dynamics of a situation" (p. 31).

The Unified Theory of Acceptance and Use of Technology (UTAUT)

The bulk of research on the predictors of technology acceptance culminates within UTAUT (Venkatesh et al., 2003). In this seminal study, Venkatesh et al. (2003) performed an empirical comparison of eight models with a combined total of 32 main effects and four moderators that are identified as determinants of intention and behavior. These eight models include TRA (F. D. Davis et al., 1989), the TAM (F. D. Davis, 1989), and innovation diffusion theory (Karahanna, Detmar, & Norman, 1999). From this comparison, researchers identified seven constructs as being a direct determinant of intention or usage. Additionally, they determined that each of the eight models have a common, underlying conceptual framework, illustrated in Figure 2.

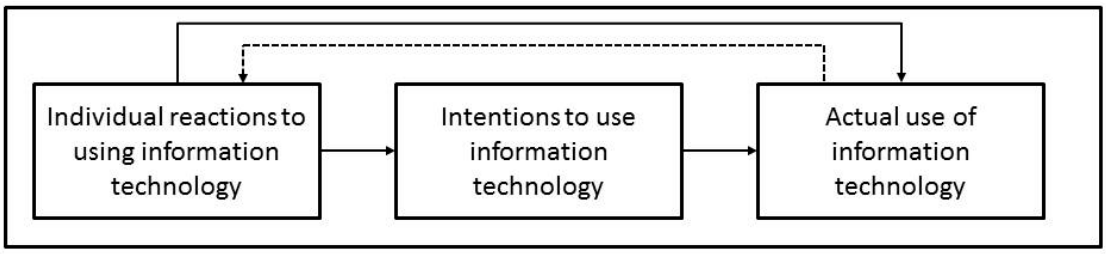

Figure 2. Basic conceptual framework underlying user acceptance models. Adapted from "User acceptance of information technology: Toward a unified view," by V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, 2003, MIS Quarterly, 27(3), p. 427.

The authors distilled the seven constructs to four important predictors of technology acceptance: (a) performance expectancy or "the degree to which an

individual believes using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447); (b) effort expectancy or "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450); (c) social influence or "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451); and (d) facilitating conditions or "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p. 453). Using these four determinants, the authors then conducted an empirical validation and cross validation of the theory. Through this, the authors found considerable support for the theory, claiming that the UTAUT "was able to account for 70 percent of the variance (adjusted R^2) in usage intention." (Venkatesh et al., 2003, p. 467).

However, in both the validation and cross-validation of the UTAUT, the focus was on the application of technology in the performance of an individual's job, not on technology used in either training or education applications. Additionally, the technology in question appears to be a single system (e.g., typically a computer application or a computer system), not complex technologies (e.g., a simulation). Moreover, the study predates many of the current innovative technologies and systems that are ubiquitous in the current setting, including smartphones, e-readers, iPads, and many current interactive course formats. Finally, the UTAUT does not appear to validate the antecedents. Simply said, there is little if any verification that the

antecedents accurately predict that individuals accept and use technology. Likewise, there is no evidence that personal narratives of individuals have been used in any study.

Change

Change is a central theme to this study because trainees who are asked to use (accept) innovative technology are essentially asked to make a change in how they learn. Change is described as an important, "profound psychological dynamic process" (Schein, 1996, p. 28). Change is also "such a multifaceted phenomenon that every attempt is necessarily limited" (Poole, 2004, p. 4). Therefore, the next section of this chapter discusses three significant areas of change literature: Schein's (1996) interpretation of Kurt Lewin's change theory as it related to the classroom; Rogers's (2003) diffusion of innovations; and Carlson's (1995) channel expansion theory. By understanding these processes, we are able to better understand the decision-making processes that facilitate change.

Change Theory in the Field and in the Classroom

Lewin's (1997, 1952) change model is as simple as it is foundational to much of the literature on change. Lewin proposes that change occurs in three phases: unfreezing, transition or move, and refreezing (Lewin, 1997, 1952; Schein, 1996). In unfreezing, the individual removes restraining forces that would prevent or significantly resist change. In the second phase, change, new behaviors are developed that shift the individual to a new level. In refreezing, the individual is stabilized at a new equilibrium, often supported by the organization, or change agents, and the change is ultimately institutionalized. Edgar Schein (1996) provides great insight into how his own thinking

has “evolved from theorizing about planned change to thinking about such processes as managed learning” (p. 27).

Schein (1996) adapts Lewin’s change model to learning because, at its origin, learning is simply a change. While the three basic steps of the change process remain the same, Schein suggests that as individuals work through each of the steps, there are multiple events they must work through. Specifically, as individuals work through the process of unfreezing, they initially experience a period of disconfirmation. Disconfirmation is characterized as a “dissatisfaction or frustration generated by data” (Schein, 1996, p. 29) that calls the previously known truth into question. While the sources of disconfirmation vary, they are a driving force signaling the need for change. To progress through the unfreezing process, individuals must recognize and “accept the disconfirming data as valid and relevant” (Schein, 1996, p. 29).

However, accepting these data often sets up an internal conflict that typically results in a defensive reaction, or what Schein (1996) calls a “learning anxiety” (p. 29). Schein describes anxiety as “the fundamental restraining force which can go up in direct proportion to the amount of disconfirmation” (p. 29) that will often lead to a denial of the data that challenges the current belief. In other words, this anxiety triggers a psychological defense mechanism that denies the data that initially signaled the need for change. This defensive reaction, initiated to avoid the potential pain created by the perception of a loss of effectiveness, self-esteem, or even the individual’s identity, must be overcome to move forward through the change process. Either the individual must overcome the learning anxiety or establish a psychological safety mechanism.

The next step of the change process, changing or transitioning, begins with what Schein (1996) called "cognitive redefinition" (p. 30). This three-step sub-process begins with a semantic redefinition where words take on a new meaning; progresses through a cognitive broadening in which a concept is expanded beyond what was once thought; and terminates with a shift in the scale of judgment or, in essence, the standards of judgment and evaluation are redefined (Schein, 1996). These steps can only occur when the learner has "opened him- or herself up to new information" (Schein, 1996, p. 31).

As Schein (1996) wrote, "If one is motivated to change…one may be able to 'hear' or 'see' something from a new perspective" (p. 31). Schein points out, that the learner's motivation to change is an important factor in the efficacy of role models. This process is often facilitated through a conversational process with someone else (Schein, 1996). The role of others' influence is discussed in greater detail later in this chapter as "opinion leaders" (Rogers, 2003, p. 308) and "change agents" (p. 366). Regardless, Schein makes it clear that it is important to have a well-prepared role model. Schein (1996) cautions:

> to rely on identification with a role model, that explains why so many consultation processes go awry. The consultant, by design or unwittingly, becomes a role model and generates solutions and cognitive categories that do not really fit into the culture of the client organization and will therefore be adopted only temporarily. (p. 33)

Once the change has occurred, refreezing occurs. Schein cautions leaners to be aware of the congruency between the new behavior and the rest of the learner's

behaviors and personality. If there is too much of a gap between the learned behavior and the remaining behaviors, it is likely that the new behavior will be unlearned. Second, it is important to let the learner identify solutions that fit him or her. Therefore, if a role model is used, he or she must not provide solutions. Instead, he or she must coach the learner to identify the solution that best fits that learner. Finally, Schein (1996) concludes when dealing with changing whole groups, "it is best to train the entire group that holds the norms that support the old behavior" (p. 34). Schein's (1996) essay showed that Lewin's model is adaptable to a learning paradigm. More importantly, his essay has expanded and enriched the understanding of change theory.

Diffusion of Innovations

Processes describing how innovation is communicated to members of a social system over time are applicable to this study. Perhaps the most well-known model for this is detailed in Rogers's (2003) monograph. Diffusion of innovations focuses on a process of how individuals accept innovation. Rogers (2003) outlines four main elements of diffusion: (1) an innovation, (2) communication through certain channels, (3) time, and (4) a social system.

As defined in Chapter I, innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). Innovation is not limited to tangible products such as computers or technologies; innovation also includes ideas and concepts. Moreover, these products and ideas do not need to be emerging or cutting edge to be innovative. By Rogers's definition, if the implementation or utilization of the product or idea is new to the user, it would be

considered innovative. Therefore, what is considered innovative is more about exposure than the relative age of the product or concept.

Understanding how an innovation is communicated among participants is significant to understanding how the technology is accepted given the social constructivist nature of technology acceptance. We must first understand that communication, as it pertains to the diffusion of an innovation, is a process in which information is created and shared among participants to gain a mutual understanding (Rogers, 2003). However, Rogers (2003) suggests that a potential challenge to the communication of an innovation is that participant groups are, by and large, *heterophilous*, meaning that participants have differing critical attributes. This has an impact on how participants select communication channels and ultimately whether they accept the innovation. Later in this chapter, Carlson's (1995) channel expansion theory is used to describe how individuals choose communication channels.

Time is the third element of the diffusion process. Rogers (2003) provides three dimensions in which time comes into play: (a) an innovation's rate of adoption within the system, (b) the innovativeness of an individual or other unit of adoption, and (c) the innovation-decision process.

The rate of adoption refers to "the relative speed with which an innovation is adopted by members of a social system" (Rogers, 2003, p. 23). Rogers explains that the typical rate of adoption can be illustrated as an S-curve because only a few people, referred to as early adopters or innovators, adopt the innovation. As more people adopt the innovation, the diffusion curve climbs. Eventually, the rate of adoption will level off

and then begin to decline as there are fewer people left to adopt the innovation. Eventually, the process of diffusion completes the S-curve (Rogers, 2003).

The innovativeness of an individual refers to the relative time in which an individual adopts new ideas compared to another member within the system (Rogers, 2003). Rogers provides several categories to describe the continuum of innovativeness ranging from innovators and early adopters to the late majority and laggards. The determination of one's position on the continuum is based on the relative time in which the individual adopts an innovation compared to the whole time for diffusion. This relativity is important because diffusion times will always vary greatly.

While each of these time dimensions has implications for this study, the most significant is the innovation-decision process. This process outlines how an innovation is adopted (or rejected) over time. The process begins with gaining an initial knowledge of an innovation, through a decision to adopt (or reject) the innovation, and then to confirmation of the decision. This process is applicable to any unit of adoption from the individual, to the organization, or even to a society. Figure 3 provides an illustration of the process.

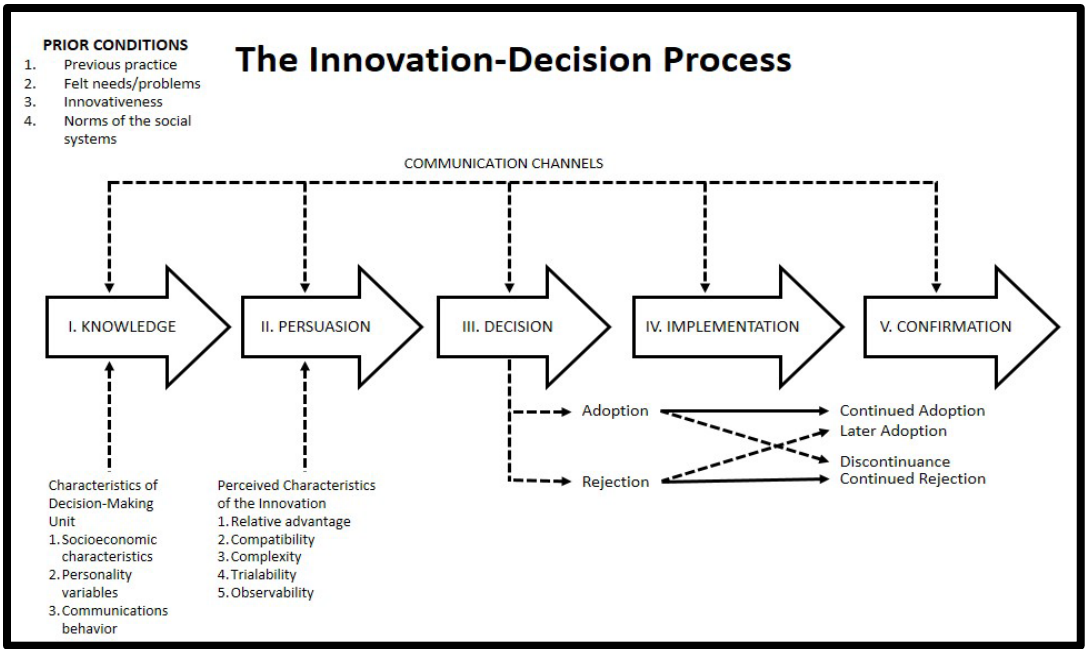

Figure 3. A model of five stages in the innovation-decision process.
Recreated from Rogers (2003). Diffusion of innovations (5th ed.). New York: Free Press., p. 170.

There are empirical studies that validate the stages of the innovation-decision process. One such study is a 1960 study of Iowa farmers conducted by Beal and Rogers (as cited in Rogers, 2003). Another study examined the process used by teachers in California. Given these and other studies cited, Rogers asserts that stages do exist in the process.

As Figure 3 shows, Rogers (2003) presents a five-stage process that is "essentially an information-seeking and information processing activity" (p. 172). The process begins when an individual is exposed to the innovation and gains some understanding of how it functions. There are three types of knowledge that are important to this stage: (a) awareness knowledge, or the basic information that alerts the individual that the innovation exists; (b) how-to knowledge, or information needed to properly use the innovation; and (c) principles knowledge, or information explaining the principles that underlie how the innovation works (i.e., the theory of the innovation). The three types of information provide the what, how, and why basics of the innovation (Rogers, 2003).

The persuasion stage occurs as the decision maker formulates an opinion of the innovation, either favorable or unfavorable. This stage signifies a change in the probable decision maker. First, during this stage, as Rogers (2003) writes, "the individual becomes more psychologically involved with the innovation" (p. 175). The individual also interprets, verifies, and validates the information gained in the first stage and begins an evaluation of the innovation. This is all in a concerted effort to form an opinion about the innovation.

In the third stage of this process, the individual makes a decision to adopt or reject the innovation. Adoption is defined as the "decision to make full use of the innovation as the best course of action available" (Rogers, 2003, p. 177) and rejection is defined as "a decision not to adopt the innovation" (p. 177). According to Rogers, the decision maker will often try out the innovation on a partial basis. This auditioning of the innovation is an important activity for adoption. Rogers (2003) observes that "most individuals do not adopt an innovation without first trying it on a probationary basis to determine its usefulness in their own situation…Innovations that can be divided for trial are generally adopted more rapidly" (p. 177). While this stage is generally when the decision to adopt or reject is made, it is important to note that any stage is a potential rejection point.

If the decision to adopt is made, the process moves forward to the next stage: implementation. Usually, this stage immediately follows the decision stage, unless logistical issue prevent an immediate implementation (Rogers, 2003). The logistics of implementation can be exacerbated when an organization is the implementer as opposed to an individual. Up to this point, the innovation-decision process has largely been a mental exercise; during this stage, steps are taken to put the innovation to use. In the final stage, confirmation, the decision maker seeks support for the decision he or she made. It is important to note that the decision maker can reverse the decision, or discontinue using the innovation, if support cannot be garnered or if conflicting messages about the innovation arise. This stage usually closes when the innovation is institutionalized (Rogers, 2003).

Rogers (2003) reports that several studies indicate that the decision to adopt and the subsequent implementation are not the termination of the process. Therefore, the confirmation stage is an important part of many decision processes. During this stage, the decision maker seeks reinforcement for the already-made decision and "seeks to avoid any dissonance or reduce it if it occurs" (Rogers, 2003, p. 189). If the decision maker cannot reduce dissonance or find support for the innovation, discontinuance is likely to occur. There are two types of discontinuance: replacement and disenchantment. Replacement discontinuance is a decision to discontinue using an innovation to make way to adopt a better innovation. Disenchantment discontinuance is the decision to discontinue the use of an innovation due to dissatisfaction with its performance to meet the user's needs.

At its root, Rogers's (2003) diffusion is social change. Diffusion cannot take place without a change in the "structure and function of the social system" (p. 6). Social networks and interpersonal communications that are capable of sharing information about the innovation greatly influence the decision to adopt or reject an innovation. The opinion leader and the change agent are important facilitators of this change and the adoption or rejection of the innovation.

Opinion leaders and change agents. As stated earlier in this chapter, most diffusion groups are heterophilous. Rogers (2003) observed that when these interpersonal diffusion networks are heterophilous, the followers seek the opinion of the opinion leaders. These opinion leaders typically have better qualifications than the followers. These qualifications include a better education, more exposure to the mass

media, more exposure to the world (i.e., better traveled), more contact with change agents, and more innovation (Rogers, 2003). Given these qualifications, the opinion leaders are "perceived as more technically competent" (Rogers, 2003, p. 308) about the innovation and consequently are able to influence others. As the leaders' influence takes hold, the followers' use of the innovation increases and consequently begins to impact the aforementioned S-curve. The influence of the opinion leader is also supported in the literature. Rogers cites 10 studies that provide support to the influencing power of the opinion leader; however, keeping the opinion leader current and trained is an essential part of maintaining his or her influence. This activity cannot be neglected.

A change agent is "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (Rogers, 2003, p. 366). The role of the change agent is to close the deal on the adoption of the innovation and slow or stop the adoption of innovations with undesirable effects. Change agents typically operate by employing one or more of the following seven strategies: (a) developing a need for change, (b) establishing an information exchange relationship between individuals, (c) diagnosing problems, (d) creating an intent to change in the client, (e) translating intent to action, (f) stabilizing the adoption and preventing discontinuance, and (g) achieving a terminal relationship (Rogers, 2003).

Channel Expansion Theory

Channel expansion theory (Carlson, 1995) emerged in response to the inconsistent empirical support within the literature concerning media richness theory (Carlson, 1995; Carlson & Zmud, 1999). Media richness theory (Daft & Lengel, 1984)

suggests that communication channels within an organization have certain characteristics that limit or enhance their ability to carry messages, making richer channels "more suited to carrying equivocal messages than other less rich channels…" (Carlson, 1995, pp. 4-5). A channel is a medium of communication and is considered richest when it provides rapid feedback, multiple cues, specifically tailored messages, and subtleties through natural language. Therefore, the richest channels provide participants (i.e., sender and receiver) the greatest opportunity to reduce the ambiguity of the message. Channels range from face-to-face communication on the richest end to formal numeric language on the least rich, or lean, end. Face-to-face communication is designated as the richest channel because of the ability for immediate feedback and the myriad of clues that can be transmitted and received, whether verbal, nonverbal, visual, etcetera. Moreover, face-to-face communication allows the message to be customized to the specific receiver and, because it requires the use of a natural language, it is able to convey the aforementioned subtleties. In contrast, binary text, the ones and zeros of computers, is considered to be the least rich because it is in no way interactive, is not able to be tailored to the recipient, and is not a natural language. It therefore provides no opportunity for feedback (Carlson, 1995; Daft & Lengel, 1984).

However, as Carlson (1995) and Carlson and Zmud (1999) explain, media richness theory was not consistently supported by empirical research. Because of these inconsistencies, Carlson conceptualized channel expansion theory. This theory explains these inconsistencies by describing media richness as "a perception of the user which is based on experience and familiarity with the medium, experience and knowledge

concerning the message topic, experience working in the present organizational context, as well as the nature of the user's relationships with each communication 'co-participant'" (Carlson, 1995, pp. 1-2). Channel expansion theory also explains how users are able to expand the richness of a channel to better accommodate the delivery of a specific message. They are able to exploit the channel's capabilities by becoming "more familiar with the channel-in-use" (Carlson, 1995, p. 2). This would suggest that the more experience a person has with the given channel and with the subject matter, the more likely the person would be to find the channel richer than other people with less experience would. In other words, the richer the channel (i.e., the technology), the more likely the individual is to accept the technology in a training application.

Digital Personalities: The Immigrants, Natives, and Settlers

Much has been written concerning the differences in people's adaptability and use of technology. Prensky (2001b) brought this discussion to the forefront by identifying the characteristics of digital natives and digital immigrants. Prensky (2001b) describes digital immigrants as, "Those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology" (p. 1). Prensky (2001b) described digital natives as "native speakers of the digital language" (p. 1). He suggests that the digital natives are very different from the other users of digital technologies because they "develop hypertext minds. They jump around. It's as though their cognitive structures were parallel, not sequential…We now have a new generation with a very different blend of cognitive skills than its predecessors" Prensky (2001c, p. 4).

Palfrey and Gasser (2008) advanced the conversation by identifying three distinct digital personalities: digital immigrants, digital settlers, and digital natives. For the purposes of this study, a digital personality refers to an individual's attitudes, interests, social roles, and other traits that relate to his or her use of technology. According to Palfrey and Gasser (2008), a digital immigrant is described as a hesitant adopter of technology, while the digital settler uses technology but still relies heavily on other analog forms of interaction. In contrast, digital natives have access and possess strong technology-use skills. Moreover, natives share a common culture that is strongly influenced by their exposure and interactions with technologies, their culture, people outside of the culture, and institutions.

Many suggest that the digital personality is inextricably tied to the era in which a person was born (Prensky, 2001b, 2006; Strauss & Howe, 1991; Tapscott, 2009). It is further suggested that the key to understanding trainees' experiences with technology is gaining an understanding of their digital personality (Tapscott, 2009). However, there is little empirical evidence to support the digital personality paradigm. Bennett, Maton, and Kervin (2008) define the conundrum:

> The debate over digital natives is thus based on two key claims: (1) that a distinct generation of 'digital natives' exists; and (2) that education must fundamentally change to meet the needs of these 'digital natives'. These in turn are based on fundamental assumptions with weak empirical and theoretical foundations. (p. 777)

In their exploration of the issue, (Bennett et al., 2008) challenge the assertions of Palfrey and Gasser, Prensky, and Tapscott through presenting recent empirical studies. For example, Bennett et al. (2008) present evidence showing that the claims of high technology skills among digital natives are overstated. As they conclude their article, the authors issue a call for research on the issue of digital personalities:

> The time has come for a considered and disinterested examination of the assumptions underpinning claims about digital natives such that researchable issues can be identified and dispassionately investigated…It is to call for considered and rigorous investigation that includes the perspectives of young people and their teachers, and genuinely seeks to understand the situation before proclaiming the need for widespread change. (p. 784)

Chapter Summary

The purpose of this chapter was to provide a preliminary review of the literature related to public safety professionals' use of innovative technology used in a public safety training context. This chapter was organized into four sections. The first section described the context for this study: emergency response training. The second section provided an overview of the literature concerning technology acceptance. The third section provided a review of change literature to provide the theoretical frameworks of this study from five perspectives: Schein's interpretation of Lewin's change theory as it relates to the classroom, Rogers's diffusion of innovations, and Carlson's channel expansion theory. The fourth section reviewed literature concerning the digital personalities of individuals.

CHAPTER III

METHODOLOGY

Schwandt (2001) defines methodology as a "social science discourse that occupies a middle ground between discussions of method and discussions of issues" (p. 161) that "involves analysis of the assumptions, principles, and procedures in a particular approach to inquiry" (p. 161). In this chapter, I address the methodological issues related to this study. I begin the chapter with a restatement of the research purpose and question. I then provide the research paradigm for the study, including the justification for and description of the qualitative methodology (hermeneutic phenomenology); descriptions of the research setting, population, and sampling techniques I employed; as well as data collection and analysis methods. I conclude the chapter with an acknowledgement of my biases as a researcher and the strategies employed to ensure the trustworthiness of the study.

Restatement of the Purpose and Research Question

In this study, I explored the experiences of public safety professionals to better understand their experiences as they use innovative technology in a public safety training context. Studying this topic is significant for two reasons. First, little research was available on the phenomenon of individuals' experience using innovative technology from an interpretivist perspective. The preponderance of available literature is focused on assessing the *determinants* of an individual's willingness to accept technology (Y.-H. Lee et al., 2011; Y. Lee et al., 2003; Yousafzai et al., 2007). Second, the implications and conclusions from this study can aid practitioners in better

incorporating innovative technologies into training. Ultimately, my aim in this study was at filling the gaps of knowledge concerning the phenomenon of using innovative technology used to facilitate training.

I designed this study to address this issue by exploring the lived experiences of public safety professional who used innovative technologies in a public safety training context. I used the following research question to guide the study: *What are the experiences of public safety trainees who are required to use innovative or emerging technology in face-to-face training?*

Research Paradigm

My goal in conducting this study was to understand the phenomenon of individuals' experiences using innovative technology in a training context. This goal fits with the philosophy and intent of the interpretivist paradigm. The interpretivist paradigm is based on "the epistemology of idealism…and encompasses a number of research approaches, which have a central goal of seeking to interpret the social world" (Ajjawi & Higgs, 2007, p. 613). I chose a qualitative approach for this study because I sought to make meaning of the individuals' lived experience as they encountered the technology. I also chose this approach because there are many perspectives, perhaps better described as realities, of technology acceptance.

Qualitative research is often used when there is a need to "understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible" (Merriam, 1998, p. 5). Denzin and Lincoln (2005) define this approach as "a situated activity that locates the observer in the world…[that] involves an interpretive,

naturalistic approach to the world" (p. 3). In contrast to the positivist paradigm, a naturalistic inquiry allows for, and in fact assumes, multiple realities and asserts that no amount of rational process or increased data can resolve the differences between them (Ajjawi & Higgs, 2007; Erlandson, Harris, Skipper, & Allen, 1993).

A key assumption I held throughout this process was that meaning is constructed as people interact with their social worlds. Much like jazz, constructing meaning is an improvisation, a process of intertwining melodies, harmonies, and a beat to create an entirely new composition (Denzin & Lincoln, 2005). To create this new composition, I used a wide variety of empirical materials, including personal experience, introspection, interview, and artifacts. I took these data and laced them together to make sense of the phenomenon as it occurs in the world. More importantly, as I did this, I examined the composition as a whole, because it cannot be decomposed and examined as pieces and parts. To isolate any part from the whole context would severely and irreparably degrade the meaning (Erlandson et al., 1993).

Social Constructivism

As I prepared for conducting this study, I undertook a long period of reflection to identify my ontological and epistemological position. Throughout this reflection, I became acutely aware that meaning and understanding—in other words, reality—is subjective and constructed through the interactions within the world. Therefore, I conducted this research through a lens of social constructivism (Crotty, 1998). Social constructivism suggests that realities, whether social, political, or even psychological, are socially constructed (Creswell, 2007; Crotty, 1998; Patton, 2002). The research

question demonstrated this ontological and epistemological worldview with the focus on the lived experience of the individuals. In this worldview, meaning is not created, but constructed from the pieces of data that exist in the world (Crotty, 1998).

Rationale for a Phenomenological Approach

Dooley and Lynham (2003) argued, "[Human Resource Development (HRD)] needs to understand the meaning of lived experiences in organizations, what it means to be a 'human resource' [sic] in the context of an organization, and it needs to do so in a deeply respectful way" (p. 231). They further noted, "the purpose of interpretive science is to make sense of, to understand text, be the latter of written, verbal or active form, and to expose hidden meaning" (Dooley & Lynham, 2003, p. 229). In these two statements, Dooley and Lynham provide an important nexus of the field of HRD and the interpretivist paradigm.

A number of approaches that can be invoked to conduct a qualitative inquiry, include grounded theory, narrative research, ethnography, case study, and phenomenology (Creswell, 2007). I used a phenomenological approach to explore the lived experience of public safety professionals as they encountered innovative technologies in a training context. Van Manen (1990) stated, "The aim of phenomenology is to transform lived experience into a textual expression of its essence…a notion by which the reader is powerfully animated in his or her own lived experience" (p. 36). The lived experience is the basis of phenomenological research (Groenewald, 2004; Moustakas, 1994; Patton, 2002; van Manen, 1990) and refers to an individual's immediate, unvarnished, and natural awareness of life (van Manen, 1990).

More importantly, the lived experience is "something of the past that can never be grasped in its full richness and depth" (van Manen, 1990, p. 36). This naturalistic ontological perspective is precisely why qualitative researchers are called to conduct research in the natural setting.

Creswell (2002) suggests three considerations for determining an approach to a research study: (a) fitting the approach to the audience, (b) relating the researcher's experiences to an approach, and (c) matching the approach to the research problem. After mulling these considerations, I determined that a qualitative approach was the most appropriate. Specifically, a hermeneutic phenomenological approach is the best to gain a greater understanding of the individuals' experience of encountering innovative technology (Creswell, 2002; Groenewald, 2004; Marshall & Rossman, 1999; van Manen, 1990).

In addition to Creswell's (2002) considerations and after a thorough review of the literature on the topic of technology acceptance, it became clear that the vast majority of research was conducted from a positivist perspective. There was little research using an interpretivist lens on the subject of technology acceptance. It is notable that the aforementioned connection made by Dooley and Lynham (2003) is deepened by asserting that to improve performance, one must first understand the current system and status quo. Without this understanding, change and its outcomes are not recognizable. They discovered that "developing deep understanding of phenomena within human organizations is imperative in building sound theory and practice in HRD" (Dooley & Lynham, 2003, p. 232). Therefore, I felt that by understanding individuals'

lived experience as they encounter innovative technology, it is possible to lay the groundwork to improve performance. These factors led me to choose a hermeneutic phenomenological methodology for this study.

Methodology: The Hermeneutic Phenomenological Approach

Phenomenology is an interpretivist, qualitative approach used in the social sciences based largely on the philosophies of Kant, Hegel, Husserl, and Schutz (Groenewald, 2004; Patton, 2002). More recently, social scientists such as Max van Manen (1990) and Clark Moustakas (1994) have built on those early foundations with the intent of returning to the concrete (Groenewald, 2004; Patton, 2002). Phenomenologists are concerned with gaining a deep understanding of a phenomenon from the perspectives of those who have experienced it. Patton (2002) notes, "Phenomenologists focus on how we put together the phenomena we experience in such a way as to make sense of the world, and, in doing so, develop a worldview" (p. 69).

Hermeneutic phenomenology is an integration of phenomenology and hermeneutics, the "philosophy of interpreting the meaning of an object" (Schwandt, 2001, p. 115), and provides the underpinning of the methodology employed throughout this study (Ajjawi & Higgs, 2007; van Manen, 1990). Smith (1983) writes that this is "a research methodology aimed at producing rich textual descriptions of the experiencing of selected phenomena in a lifeworld of individuals that are able to connect with the experience of all of us collectively" (p. 80).

The lived experience is reflexive and can never be fully captured. Therefore, a reflective approach provides the best path for the researcher to arrive at a fuller

understanding (essence) of the phenomenon (Creswell, 2007; Moustakas, 1994; van Manen, 1990). The hermeneutic phenomenology, as described by van Manen (1990), allows the researcher to explore the lived experience of individuals by interpreting the meaning of the lived experiences (Creswell, 2007).

This in-depth exploration occurs through the dynamic interplay of six distinct research activities: (a) addressing a phenomenon that interests the researcher, (b) investigating the lived experience not as it is conceptualized, (c) reflecting on the essential themes that characterize the nature of the phenomenon, (d) describing the phenomenon through writing and then re-writing, (e) maintaining a strong and focused relation toward the phenomenon, and (f) balancing the research context by considering the parts and whole (Creswell, 2007; van Manen, 1990).

Hermeneutical phenomenology uses the person-to-person interview as a primary method. This method is critically important because of the specific purpose it serves in eliciting descriptions of the lived experiences from the participants (Patton, 2002; van Manen, 1990). The interview is used to explore and gather experiential narrative materials; it may also be used as a vehicle to develop a relationship with an interviewee (van Manen, 1990). Kahn and Cannell, (as cited in Marshall & Rossman, 1999), describe the interview as "a conversation with a purpose" (p. 108). Therefore, I carefully chose interview questions to elicit the responses that focused on the phenomenon. Equally important, I took extreme care during the interviews to let the participants' narrative of the experience unfold from their perspective instead of how I

thought it should (Marshall & Rossman, 1999). Consequently, the interviews were not rigidly structured to place the method above the question.

The basis of this study was rooted in a practical problem of understanding how individuals react to and cope with encountering innovative technology in a training context. Throughout the research process, I focused and reflected on essential themes to better understand the lived experience of individuals as they deal with the challenges and promises of innovative uses of technology training applications (Creswell, 2007).

Methods

This section describes the methods I used when conducting and reporting this phenomenological research study. My methods include sampling, data collection, and data analysis. All of these methods are informed by the naturalistic inquiry approach (Crotty, 1998; Denzin & Lincoln, 2005; Erlandson et al., 1993) and the phenomenological methodology (Creswell, 2007; Moustakas, 1994; van Manen, 1990). I obtained the Texas A&M University Institutional Review Board's (IRB) approval of the research design before conducting the fieldwork (Appendix A).

Sampling Procedure

The intent of using a phenomenological approach is to explore a phenomenon extensively and not to generalize to a broader population (Creswell, 2007). To accomplish this goal, I used *purposeful sampling*, specifically, a criterion-based sampling strategy that "leads to selecting information-rich cases for study in depth" (Patton, 2002, p. 46).

Selection of the research setting. The setting of this study is an international public safety training organization that is a state agency in the southwestern United States. This state agency provides a wide range of technical and skills training programs aimed at employed workers and those entering the labor force. During fiscal year 2011, the agency provided training and technical assistance to more than 180,000 people throughout the world. The agency is a member of one of the largest university systems in the state and consists of five divisions. Each division uses innovative technology in training, including the use of tablet technology to replace hardcopy textbooks (Sheehan, 2011) and the creation of a novel simulation support software package (Moats, Hightower, Ware, & Wall, 2004). The training courses are typically one to five days in duration, however, some courses do last longer. The courses train public safety professionals in job-specific skills.

Population and study participants. I focused this study on public safety professionals who attended training that incorporated the use of innovative technology as the population for this research study. The public safety community in the United States has morphed from the tradition of fire services, law enforcement, and emergency medical services to include more than 10 disciplines. These disciplines include not only the aforementioned three, but also the disciplines of emergency management, public works, hospital and health care providers, public health, hazardous materials response, state military services, and others. The role of these disciplines is to be the first responders and first receivers in times of disaster.

While college degrees are preferred for entry into the public safety professions, they are not required. A college degree does not adequately prepare an individual to perform the specific tasks of a public safety professionals' job. Therefore, training is essential to career development, especially in building skills in emergency response and management. Within the training itself, it is common that various types of technology are used to facilitate training courses. In many cases, these technologies are used to simulate actual working conditions, thus lowering the learning transfer distance. However, in these cases, the technology used is not a tool that would ever be used on the job despite it being a primary tool used to conduct the training. This research study is concerned about this particular nuanced use of technology.

I used a criteria-based sampling strategy to identify and select participants for this study. In an effort to maintain the ability to provide an in-depth description of the phenomenon, I limited the study to information-rich participants who met the four criteria listed below. Each participant:

- attended a training course directly related to the performance of his or her job;
- used an innovative technology to facilitate training;
- was a member of a public safety discipline (fire service, law enforcement, emergency management, public works, health care, public health, hazardous materials response, etc.) at the time of his or her training; and
- was willing to participate in a 60–90 minute taped interview with the possibility of a follow-up interview.

I selected participants meeting the criteria from those who had attended training courses at the organization where I am employed. This purposeful selection strategy was both practical and feasible, because my organization trained more than 180,000 personnel in fiscal year 2011, with a great majority of those personnel being public safety professionals. This allows for a diversity of innovative technologies not just a single type. Additionally, I purposefully selected participants to reflect some diversity in areas of gender, educational background, and job experience.

Once I identified potential participants, they were contacted through email or in person to identify their willingness and interest in participating in this study. I drew a convenience sample from eligible participants based on considerations of time, expense, and access. I sent each participant a formal introductory letter (Appendix D) and a demographic data collection tool (Appendix E). The introductory letter (Appendix D) explained the purpose of the study and the extent of the participant's involvement. I used the demographic data tool to acquire background data including research participants' experience with various technologies including tablets, smartphones, and other types of technology. The results from the demographic data tool aided me in determining the individuals' experience within their profession and with technology.

I sent participants who were not selected using the criteria an email thanking them for their interest and informing them that the participants had been selected. These persons were also informed that unless they explicitly requested otherwise, their names and contact information would be held on file for approximately six months in case they

were needed to be a replacement participant in the study or the study was expanded to include more participants.

I also gave participants an informed consent form (Appendix C) at the time of the interview. The consent form outlined the nature and purpose of the study, the participant's right to stop or withdraw from the study at any time, and his or her right to review statements made in the interview. The participants were required to sign the informed consent form in order to participate in the research study.

Data Collection

Aligned with the phenomenological design, in-depth phenomenological interviewing strategy served as the primary source of data collection. Once I collected the demographic data, I established a schedule of interviews with the study participants. I followed an interview protocol (Appendix F) for each interview in order to maintain consistency throughout the study. Using Asmussen and Creswell (as cited in Creswell, 2002), the interview protocol consisted of the following sections:

1. a header section that includes the date and time of the interview, the location of the interview, and the identifier for the interviewee;
2. instructions for the interviewer to maintain consistency from one interview to another;
3. the questions to be asked by the interviewer;
4. areas to write field notes; and
5. a reminder to thank the interviewees.

I also used probing questions to clarify some responses and to encourage the participants to elaborate on emerging themes (Creswell, 2002; Patton, 2002). I structured the interview questions to elicit the lived experience of the participants. Each interview involved open-ended questions based on the main research question. Specifically, I sought to ascertain the personal experience of the participants relating to their encounter with innovative technology used in training applications.

The data collection strategy for this study consisted of in-depth, conversational interviews of the participants. Interviews were scheduled so that they could be conducted after the participants' training had concluded. These interviews attempted to better understand the lived experience of the participants. Each interview was video recorded and took between 40 and 75 minutes.

I expected to receive in-depth descriptions of the interviewees' experiences with technology inside and outside of the classroom. I observed them during the interviews and recorded their body language, vocal tone, and pitch, as well as expressions, as they related their experiences. In addition, I made field notes for the purpose of documenting the interview and the setting (Patton, 2002). Field notes are essential tools in qualitative research (Creswell, 2002; Patton, 2002) because they contribute to the richness of the data. Finally, I video recorded the interviews for later reference, and the recordings were transcribed either by me or a professional transcription service as soon as possible following the interviews.

Data Analysis

Data analysis for qualitative data is a meticulous and time-consuming process. To analyze the data, I followed a five-step process outlined by Ruona (2005) (1) sensing themes, (2) constant comparison, (3) recursiveness, (4) inductive and deductive thinking, and (5) interpretation to generate meaning (p. 236).

Sensing themes. Sensing themes is a process in which patterns are *seen* from seemingly random information gathered during data collection. The process requires that the researcher be immersed in the data and remain open to detect the patterns. In other words, the researcher must be able to see the "codable moment" (Ruona, 2005, p. 237).

Constant comparison. The constant comparison method was developed by Glaser and Strauss (1967). This method is a continual comparison of the data throughout the process. I explain how this process was implemented in Stage Two: Familiarization.

Recursiveness. Recursivness is a "simultaneous process of data collection and analysis" (Ruona, 2005, p. 237). To be true to this process, I began my analysis almost as soon as I started the interviews. Initially, I conducted three pilot interviews, had them transcribed, and reviewed the transcriptions to identify predominant themes. As a result, I was able to adjust probes and identify emerging themes. I maintained this recursive process throughout the data collection and data analysis process.

Inductive and deductive thinking. Inductive thinking is a process of building and constructing a theory or concept from the data; whereas deductive thinking is a

process of testing the theory or concept to prove or disprove (Ruona, 2005). These processes were employed throughout the research processes and are inherently built into the other components.

Interpretations to generate meaning. Like inductive and deductive thinking, the process of interpretation to make meaning is naturally embedded in the processes. This process is much like putting together a jigsaw puzzle upside down and in the dark. In other cases, it is like pinning together scraps of cloth with straight pins, unpinning, rearranging, and re-pinning to make a pattern that is somehow pleasing because it is a reflection of the understood new reality, in other words, a theory. Ruona (2005) explains this best by writing "We are, in essence, engaging in theory building…[in which] the theory is derived "inductively from the 'real world' to enhance our understanding" (Turnbull, 2002, p. 319)" (p. 239).

Four stages of data analysis. I accomplished these five-steps through four stages (Ruona, 2005).

Stage 1: data preparation

Once I collected the data, the video recordings were immediately transcribed and field notes were typed. The goal of this stage is to organize and format the data so that the analysis process can begin. During this stage, I read and re-read the transcribed interviews while watching the video of the interview to ensure accuracy of the transcripts. During this part of the process, I began to observe some contradictions between what the participant said and what their body language conveyed. For example, a participant may have stated that he or she felt comfortable using the innovative

technology; however his or her body language clearly revealed a level of discomfort as the memory of the event was recalled. These contradictions between the spoken words and the physical reaction would have been impossible to identify without the video recordings.

During this stage, I also assigned each participant a pseudonym to ensure anonymity and protect the privacy of each participant. After this was completed for each interview, I created a six column table that allowed me to have a column for (a) coding of the response, (b) the participant identifier, (c) the question number, (d) the sequence number for each response, (e) the actual response, and (f) any comments I may need to make. Through the use of my word processing application, I then formed a table around the individual responses.

Stage 2: familiarization

The goal of this stage is to engage the data and begin the analysis. During this stage, I was able to use the tables I created in stage 1 and my research journal to record what I learned from the review of the transcripts. I also began separating the nuggets representing themes and initial patterns that emerged as I became more and more familiar with the data. For the purposes of this research study, themes are expressions or "structures of experience" (van Manen, 1990, p. 79) and can be in the form of "'significant statements'[*sic*], sentences, or quotes that provide an understanding of how participants experienced the phenomenon" (Creswell, 2007, p. 61). Moreover, themes are a form of capturing the phenomenon—the lived experience, not tangible items (van Manen, 1990).

Stage 3: coding

Stage 3 is a continuation of stage 2, but with a greater intensity on the analysis. This is where the segmenting and coding takes place. At this stage, I removed the interviewer's comments and examined the transcripts in great detail. Using the constant comparison technique (Glaser & Strauss, 1967), I began creating themes that fell into the initial categories created in stage 2. Initially, 10 major categories were created with each having between two and nine subordinate codes. The list of codes was created based on the data, not the other way around.

The constant comparative method developed by Glaser and Strauss (1967) allowed me to organize the data into meaningful categories (themes) by constantly comparing interviews within interviews and against other interviews (Merriam, 1998; Ruona, 2005). As the themes initially emerged, they were grouped or *horizontalized* (Moustakas, 1994). I conducted this step in two waves of review and reflection. In the first wave I thoroughly read each interview transcript in context and identified and assigned codes. The second wave took place a few days later. In this wave I read the transcripts again and reviewed the assigned codes. During this wave, I created additional codes as needed. In doing this, I made important decisions about the scope and focus of the study, as well as developed additional questions to further guide the research. In some cases, I recoded data to a more appropriate code. I recorded each code in my research journal.

Stage 4: merging and working with the data to generate meaning

Stage 4 is the final stage of Ruona's (2005) process. In this stage, I merged all of the interviews into a single table. This allowed me to conduct group-level analysis. In this table, I was able to sort the data in several ways: by code number; by question number; and by participant. At this point, I evaluated each expression using two criteria: (a) Does the expression contain an experience that is necessary for the reader to understand the experience? and (b) Can it be abstracted and labeled (Moustakas, 1994)? If the expression did not meet these two criteria, I eliminated it; I grouped those expressions that met the criteria into "clusters of meaning" (Creswell, 2007, p. 61). I deleted incompatible expressions or those that were not specifically and clearly stated in the complete transcription. From these, I created interpretations of the experiences, called *textural descriptions*, for each participant (Creswell, 2007; Moustakas, 1994). I also created *structural descriptions*, or interpretations of the expressions that describe how the context or setting influenced the participant's experience of the phenomenon (Creswell, 2007). I then synthesized these descriptions for each individual to create *textural –structural* descriptions. From these, I created a composite description of the meanings and essences of the experience to represent the group as a whole (Creswell, 2007; Moustakas, 1994).

This recursive process began with the first interview and continued until a saturation of the categories occurred (Ruona, 2005). Egan (2002) writes that "data saturation is evident when data collection no longer contributes to elaboration of the phenomenon being investigated…It is left to the discretion of the researcher to

determine the adequacy…" (p. 286). To determine when saturation was reached, I constructed a table to track the categories that were the focus of the study. I created this table well after the second wave of coding was completed to avoid artificially assigning data into categories/codes.

Ethical Issues

I took several steps throughout the course of this study to ensure a high ethical standard. First, I successfully completed the Collaborative Institutional Training Initiative (CITI) program requirements for the *Course in the Protection of Human Subjects: Social and Behavioral Research for Investigators and Key Study Personnel*. Second, I followed the guidelines provided by the Texas A&M University IRB.

Third, I provided each participant an informed consent form prior to participating in the study. The form explained their rights, including the right to withdraw at any time before, during, and after the study. To protect the confidentiality of the participants, I assigned a code to the video recordings, transcriptions of each interview, and my field notes. I kept all study-related data on a separate media drive and encrypted it to avoid unauthorized access to the files. I kept the electronic and hardcopy files in a secured drawer in my home office; these files will be destroyed seven years after the completion of the research project. The informed consent form explicitly states that by signing the form, participants grant me permission to publish the results in a thesis or other publications with the provision that the quotations will be anonymous.

Trustworthiness

In quantitative research, reliability and validity are key concepts to explain the soundness of the research. While these terms are not used in qualitative research, the term trustworthiness is used to refer to the soundness of the research (Merriam, 1998). Lincoln and Guba (1985) proposed a framework of four constructs to assess the soundness of qualitative research: (a) credibility, (b) transferability, (c) dependability, and (d) confirmability (Marshall & Rossman, 1999; Schwandt, 2001).

Credibility

Credibility refers to the relationship between the "constructed realities" in the minds of the participants and the realities attributed to them (Erlandson et al., 1993, p. 30). Credibility is the demonstration that the research was conducted in such a way that it accurately identifies and describes the subject and context. More importantly, Patton (2002) suggests that the credibility of a qualitative inquiry rests on three criterion: (a) the rigor of the research methods and techniques; (b) the credibility of the researcher; and (c) "a fundamental appreciation of naturalistic inquiry, qualitative methods, inductive analysis, and holistic thinking (p. 461). Lincoln and Guba (1985) provide several techniques to achieve credibility that were used in this study. In what follows, I have detailed the techniques I employed during this study.

Prolonged engagement. Prolonged engagement is a technique in which the researcher is immersed in the context being studied (Erlandson et al., 1993). This technique helps the researcher ensure that he or she can completely understand the context. Additionally, this also helps build trust relationships with the participants that

ultimately reduce the distortion of data created by biases and the researcher's impact on the context (Erlandson et al., 1993). To accomplish this, I provided each participant the opportunity to be interviewed in a classroom, at his or her office, or in at a neutral site. All but one of the participants chose to be interviewed in a classroom. Another promise of prolonged engagement is the ability to learn the lay of the land. Although this is a potential bias, my experience with the programs involved in this study provided ample opportunity to understand the context and nuances of the programs. By spending a significant amount of time in the classroom where the specific innovative and/or emerging technologies were used, I was able to minimize the distortions of my presence.

Referential adequacy. From the outset of this study, I made the conscious choice to video record each of interviews in this study so that I would be able to go back and watch the mannerisms of the participants, listen to the audio, and remind myself of the moments that synchronize with my field notes and reflexive research journal well after the interviews had concluded. Lincoln and Guba (1985) suggest that these recordings and the other data serve as "benchmarks against which later data analyses and interpretations…could be tested for adequacy" (p. 313).

Triangulation. The central point of triangulation is to examine a conclusion from multiple vantage points (Patton, 2002; Schwandt, 2001). I used a variety of strategies to triangulate, or corroborate evidence in descriptions and themes, to ensure the accuracy of this study (Creswell, 2002; Schwandt, 2001). These strategies included: (a) comparing the multiple accounts of the lived experience of encountering innovative technologies in training applications, (b) keeping a researcher's journal to journal my

experiences and bracket my biases, and (c) using multiple types of data sources (e.g., field notes, transcripts, video recordings, etc.).

Peer debriefing. Peer debriefing provides the researcher an opportunity to "step out of the context being studied to review preconceptions, insights, and analyses with professionals outside the context who have enough general understanding of the study to debrief the researcher and provide feedback…" (Erlandson et al., 1993, p. 31). I accomplished this through two distinct groups. First, I belong to a group of scholar-practitioners that convenes to coach, mentor, and debrief one another as we continue on our scholarly journey. This group meets Lincoln and Guba's (1985) description of the "disinterested peer" (p. 308). Through these debriefings, I was able to discuss my biases and probe other aspects of the study that I had been mulling. In most cases, this was helpful to the point of being therapeutic, because I was able to discuss the struggles and challenges of the process that may have otherwise tainted my judgment with peers (Lincoln & Guba, 1985). Second, throughout the dissertation process, I have engaged my doctoral committee for counsel and guidance. Both of these have provided me a trusted outlet to vent, ponder, and plot this research project.

Member checking. Member checking is when the "data, analytic categories, interpretations, and conclusions are tested with members of those stakeholding groups from whom the data were originally collected" (Lincoln & Guba, 1985, p. 314). This process provided the study participants an opportunity to review the results to ensure that I correctly interpreted and described their experience (Creswell, 2002; Erlandson et al., 1993; Merriam, 1998). It also allowed me an opportunity to reflect more deeply on the

stories and data to ensure that I was treating it and these experiences with the deep respect they deserve. This strategy resulted in participants agreeing with the interpretation and description or provided me an opportunity to make changes until the participants agreed with the interpretation. Participants were given opportunities to review the descriptions each time changes were made. The cumulative result of these triangulation strategies has produced a research study that accurately represents the lived experience of public safety professionals who have encountered innovative technology in training applications.

Transferability

Transferability addresses whether the research findings will be useful to those with similar situations with similar research questions (Erlandson et al., 1993). While positivists refer to *external validity*, this concept is not possible in a naturalist study. At best, the reader must make the determination on whether the context and the results of the study are transferable. The only ability I have to impact transferability is to write a "thick description" (Lincoln & Guba, 1985, p. 316) that provides the reader with enough information to make the transferability decision.

Dependability

Dependability relates to the consistency of a study or the ability to replicate the study (Lincoln & Guba, 1985). However, replicating an interpretivist study is problematic given the ever-changing social world that is constantly being constructed (Marshall & Rossman, 1999). Therefore, dependability is addressed as the "researcher attempts to account for the changing conditions in the phenomenon … and changes in

the design by an increasingly refined understanding of the setting" (Marshall & Rossman, 1999, p. 194).

Lincoln and Guba (1985) propose multiple strategies to address dependability. For this study, I have chosen to use an "inquiry audit" (Lincoln & Guba, 1985, p. 317). This audit is analogous to a fiscal audit in which an individual is called in to authenticate financial accounts. In the case of an inquiry audit, the auditors are my doctoral advisory committee; they examined both the *process* and the *product* of my inquiry (Lincoln & Guba, 1985). Their seal of authentication will be evidenced by the completed signature sheet that covers this dissertation.

Confirmability

Erlandson et al. (1993) citing Lincoln and Guba (1985) write "an inquiry is judged in terms of the degree to which its findings are the product of the focus of its inquiry and not of the biases of the researcher" (p. 34). Confirmability, in the positivist perspective, is used to address objectivity of the researcher; however, as I have previously stated, qualitative studies are subjective and therefore not possible to be replicated given the changing social context. The confirmability construct is still possible to address because it is intended to ask the question: Can the findings of one researcher be confirmed by another? (Marshall & Rossman, 1999). Lincoln and Guba (1985), as well as Erlandson et al. (1993), suggest that it is possible to accomplish dependability and confirmability through the inquiry audit. To accomplish this, an audit trail must be patent. Halpren (as cited in Lincoln & Guba, 1985) suggests that the audit trail consists of several categories of materials: (a) raw data, (b) data reduction and

analysis products, (c) data reconstruction and synthesis products, (d) process notes, (e) materials relating to the intentions and dispositions, and (e) instrument development information. Through the dissertation process, these have been reviewed, revised, and reviewed again by my doctoral advisory committee.

Role of the Researcher

Denzin and Lincoln (2005) invoke the image of the qualitative researcher as a maker of quilts, the bricoleur. This metaphor suggests that the researcher must piece together the squares of knowledge, even if the quilt-maker must "invent, or piece together, new tools or techniques…" (Denzin & Lincoln, 2005, p. 4). It is with this metaphoric image in mind that I understood my role as I conducted this research. In the subsequent paragraphs, I describe my position, including my experiences, assumptions, education, and career life.

Researcher's Position

In phenomenological research, it is widely held that the researcher cannot be separated from his or her own biases and beliefs (Annells, 2006; Groenewald, 2004; Moustakas, 1994; Ruona, 2005; van Manen, 1990). Likewise, it is widely held that "a researcher's epistemology … is literally her theory of knowledge, which serves to decide how the social phenomena will be studied" (Groenewald, 2004, p. 5). However, one significant issue that influenced this study is that I was the primary instrument for this study. There are advantages to this, but also cautions that should be well understood by the researcher. Among the advantages are that the researcher is able to adapt and adjust to the research setting to obtain rich and meaningful information. A disadvantage is that

the researcher is human and, therefore, has biases and assumptions that influence the study. This means that mistakes will be made and personal biases cannot be completely avoided. Therefore, researchers conducting qualitative research must be very aware of these factors and their influence on the findings of the research.

Van Manen (1990) suggests that the researcher's personal experience is the starting point for a phenomenological study and nothing could be truer for this study. This study lies in the nexus of my professional and academic careers to this point. Because of this, I have certain assumptions that are a source of bias (Agee, 2002; Merriam, 1998). I have a long career of public service working for local, state, and federal governments, including service in the United States Navy as a medic. Consequently, I have experienced a significant amount of the available training to the public safety disciplines. Moreover, for more than two decades, I have developed training, facilitated exercises, and designed simulations used to train public safety personnel around the world. Throughout my youth and adulthood, I have witnessed the positive impact that training has had on improving the preparedness of public safety personnel. I have observed how innovative approaches to training have captured the individuals' imagination and made a marked improvement in their performance. I have also been the recipient of poorly designed and executed training that left me angry and empty.

I am also a self-professed techno-geek and, as such, an advocate for the use of technology, when appropriate. I have taken opportunities to experiment with and use many innovative technologies in emergency response operations and in the execution of

my job, as well as public safety training. Over my career, I have been recognized for the use innovative technology in public safety training courses. Unfortunately, I have also seen the effects of when technology is used improperly in training, including increased transfer of training and decreased participant satisfaction. I am a firm believer that technology used for the sake of using technology is doomed to reap unsatisfactory results in training performance. Technology must be carefully integrated into the training.

I have taken care throughout this process to ensure that my life experiences are not the primary focus of the study. Prior to conducting the interviews, I created "a personal description of the lived experience" (van Manen, 1990, p. 54). In writing this description of my personal experience, absent any interpretations or explanations, I have been able to identify my own biases and identify potential issues that will recur in the other interviews. As van Manen (1990) states "…the phenomenologist knows that one's own experiences are also the possible experiences of others" (p. 54).

Chapter Summary

This chapter addressed the methodological issues related to this study. The chapter provided a restatement of the research purpose and question: *What is the experience of public safety professionals who are required to use innovative or emerging technology in face-to-face training?* This chapter also discussed the research paradigm for the study, including a justification for and description of *hermeneutic phenomenology*. The chapter provided descriptions of the research setting, population, and sampling techniques employed in the study, as well as data collection procedures

and analysis process. The chapter concluded with a description of the researcher's role and the strategies employed to ensure the trustworthiness of the study.

CHAPTER IV

FINDINGS

The purpose of this hermeneutic phenomenological study was to describe the lived experience of public safety professionals as they encounter innovative technology in training applications. This research study was based on a single question: What is the experience of public safety trainees who are required to use innovative technology in face to face training? To address this question, six public safety trainees who completed a training course using innovative technology were interviewed. The interviews were transcribed verbatim by a professional transcriptionist and me. In addition, observational data, field notes, and videotaped data were collected. All these data were analyzed to elicit themes which are reported in this chapter.

This chapter presents major findings related to the research question. The chapter begins with an introduction of the research context. This is followed by descriptions of the study participants. Participants were assigned a pseudonym to protect their confidentiality. The profile of each participant provides the context in which major themes emerge through the data analysis process. Direct quotes are included to better understand each participant. Each quote was identified by a code (e.g. Everett, Q1T2), indicating the location of the direct quote. Data analysis was conducted using Ruona's (2005) five step process consisting of: (a) sensing themes, (b) constant comparison, (c) recursiveness, (d) inductive and deductive thinking, and (e) interpretation to generate meaning. Marshall and Rossman (1999) point out that this process "entails uncovering patterns, themes, and categories" (p. 155). These patterns, themes, and categories enable

me to better understand the meaning of the participants' world as described by them. Following the participant profiles is the report of the major themes that emerged from the data analysis.

The Training Context

Innovative technologies were featured in the training programs selected for this study. One of innovative technologies used was a computer-supported simulation used to facilitate multiple scenario-based practical decision-making exercises. The second technology was an iPad used as both an e-reader and a photo viewer. How these technologies were used to assist training is described below.

The Computer-based Simulation

A unique, computer-based simulation was used to support the delivery of practical scenarios. These scenarios provided a context for decision-making through incident management exercises. Three of the study participants were trainees in a 28-hour training course included approximately 45 participants with varying levels of experience from emergency services organizations across the United States. The simulation was developed specifically for this course. It also provided participants situational awareness information about the unfolding incident, including graphic displays of map data, resource deployment, and video segments that represented television news. However, the simulation was not intended to be used outside of the training facility; therefore, it had no operational capabilities.

The course took place in a large training room with more than 50 computers, three large (10' X 10') projected displays, and artifacts that made the room look like an

incident command post used in the management of large-scale incidents. The course had 18 instructors and role players who were subject matter experts in incident management and the operation of the simulation.

iPads

iPads were used in several law enforcement oriented courses to support practical application activities and as an e-reader. Three of the participants in this study attended a 40-hour course that used the iPad as a photo viewer and an e-reader to view the course participant manual. Participants were not given a printed copy of the participant manual. Each course had approximately 20 participants. In addition, the participants were required to use a single lens reflex (SLR) digital camera and electronic flash to take photos of staged crime scenes. The course was intended to teach crime scene investigators and detectives proper photographic technique. According to the course description, "The Forensic Photography I course addresses the basic concepts of photography and their application to thorough, professional crime scene documentation. Course instruction is through lecture, case review, and application exercises" (TEEX, 2013).

Participant Profiles

Table 2 provides a summary of the six participants in this study. Five men and one woman were interviewed in this study. Four of the six interviewees are still active members of emergency services organizations; two are retired, although one still volunteers his time as a reserve deputy sheriff. The remaining interviewee retired and was employed as a part-time instructor for an emergency services training organization

in the southwest United States. Two of the six interviewees have had a career primarily in the fire service spanning more than 25 years. The remaining four participants are law enforcement professionals with experience ranging from less than one year to more than 25 years.

Everett

Everett is one of the most experienced participants in the study. At the time of the interview, he was a career firefighter in his 50s, working in a large, west coast metropolitan fire department. He had more than 25 years of experience in the fire service and at the time of the interview, he was working as a Battalion Chief supervising a large section of a metropolitan city's fire response efforts. His duties included supervising multiple fire companies in the central area of his city including overseeing the fire response and preparedness efforts for more than one million citizens. Everett had been an instructor for more than two decades and was an instructor at a large emergency services training organization. Everett was experienced with technology such as smartphones and computers. Based on his experience with technology, it was clear that Everett's digital personality can best be described as a digital settler.

I interviewed Everett on a day when he had been teaching a course to a group of about 48 first responders from various U.S. communities. Immediately before our meeting, I observed him in the classroom with his students. He is a man of medium build that stands straight. Even after a fast-paced nine hour day, the starched white shirt and

Table 2

Profiles of Participants

[1]Name	Age Range	Formal Role at time of Training	[2] Role	[3]Discipline	[4]Emergency services experience	[5]Instructor experience	Innovative technology
Everett	51-60	Captain	Battalion Chief	Fire	> 25 years	Yes	Simulation
Juan	61-75	Emergency Management Coordinator	Retired	Fire	> 25 years	Yes	Simulation
Terrence	41-50	Instructor	Instructor	Law	> 25 years	Yes	Simulation & PowerPoint
Rusty	31-40	Detective	Detective	Law	11-15 years	Yes	iPad
Bobby	61-75	Reserve Investigator	Reserve Investigator	Law	11-15 years	No	iPad
Teresa	23-30	Undergraduate Student	Crime Scene Technician	Law	< 1 year	No	iPad

[1] Participants were assigned pseudonyms to protect their identities during analysis and reporting of the findings.
[2] This indicates the role at the time of the interview. This information was provided by each participant during the interviews.
[3] This indicates the emergency services discipline in which the participant spent the majority of their time.
[4] This is accurate as of the date the information was provided (i.e., date of the individual interview). The information was informed by the demographic questionnaire and the interviews.
[5] This was based on information gathered during the interviews.

dark blue pants were still crisp and fresh. One of the first things that I noticed about Everett was his ability to relate to the course participants. He was confident and definitely in charge of his students. At the same time, he was gentle and encouraging his students as he coached them through the important decisions they needed to make. His ability to relate and communicate equipped him to engage his students and they listened attentively as Everett shared his advice based on the years of experience.

After Everett completed his work for the day, we walked across the hall to a small, quiet breakout room immediately adjacent to an expansive, technology-laden, 7,500 square foot training room. This room is located in a 37,000 square foot facility situated in the middle of a 280-acre emergency services training complex. As we sat down and I set up the camera and audio recorder, Everett's confidence and enthusiasm continued to radiate despite the full day of training he had just completed.

Prior to the interview, Everett indicated that he was willing to assist in any way he could because of his own background as an instructor. He indicated that this research topic was important to him because it would ultimately equip him to improve the students' experiences. This reveals another truth about Everett: as an instructor, he is most concerned about the trainees he teaches. During the interview, Everett recalled his experiences encountering the aforementioned computer-supported simulation.

Everett was an articulate and intelligent man. His eyes were bright and alert. As we started the interview, Everett was relaxed, but engaged and deliberate in his responses to each question. These things conspired to reveal Everett's most striking feature: his *command presence.* Everett's deep baritone voice exudes confidence and

intensity; while his body language and posture demonstrate his ease with the subject at hand. This left me with a sense that this person is genuine and can be trusted.

As I asked each question, Everett was ready with an answer. It seemed almost as if he had been given the questions ahead of the interview. The intensity of his answers revealed his passion for understanding why some people accept, while other reject, technology used in training. Everett's answers also revealed his interest in the training outcomes. He is one of four people interviewed who are also trainers for their home organization. He admitted that he did not attend the course to learn new content per se as is the case with most trainees. Instead, Everett stated that his interest in the course was triggered by his curiosity and perhaps also his skepticism of whether the technology would provide a suitable training environment for training public safety professionals who might direct incident response operations:

> Ironically, the process that the class taught was a process I was familiar with. However, I had never participated in an exercise simulation. Most of my experience was more of hands-on, real-life type experience. I was really interested in the laboratory-type setting because specifically the skill set necessary to manage an escalating incident – a crisis if you will – is something that doesn't occur frequently...But to be quite honest, I was skeptical whether any laboratory setting could capture the sense of urgency that's necessary to build that skill set to effectively manage a crisis. (Everett, Q1T2-3)

As we continued our discussion, the irony of our setting struck me. As we sat discussing the massive amounts of innovative technology used to train public safety

professionals in the training room next door, we were meeting in a room with only a telephone, fax machine, and a couple blank whiteboards. The walls were bare to the point that the room echoed as Everett's deep voice boomed his responses. It was a very stark contrast to the training room that we had just left.

Juan

Juan is a retired firefighter in his 60s, originally from a medium-sized community in the southern United States. He has more than 25 years of experience in the fire service. Juan was also the emergency management coordinator for a rural county in Texas. In addition to his emergency response experience, Juan has also been an instructor for public safety and other organizations for much of his career. He has helped plan and coordinate training courses, as well as develop and deliver practical application exercises for communities within his home state. At the time of our interview, Juan was retired, but worked part time for an emergency services training organization.

Juan also chose to reflect on a course with the computer-supported simulation for his interview. Juan's encounter with the simulation technology was in an earlier version of the same course as Everett's and occurred more than ten years prior to his interview. Juan explained that prior to taking the training, he had some experience with technology including computers and console games. This level of experience and exposure probably places Juan as a digital immigrant before his training experience.

We had arranged the interview a couple days prior to actual the interview. Juan and I met for our interview after he participated in a week-long training course as role player. Earlier, on the day of the interview, I observed Juan as he performed his role in

the exercise control cell. He had just finished a long, nine-hour day that included a six-hour, continuous exercise. During this exercise, Juan portrayed a number of roles including the mayor and citizens of the city affected by the simulated disaster. He communicated with the training participants not from a podium, but rather from the other end of a telephone. As I observed him in action throughout the morning, I noticed Juan's proficiency with the simulation. He was very confident in his assigned role and also in using the technology required to perform the job. Throughout the exercise, Juan interacted with the simulation he once had a great deal of apprehension about using. The irony was not lost on either of us.

Juan was clearly tired, but was more than willing to participate in this research project. He made it clear that this topic was important to him as he felt his experiences could help others who were coming into future classes. We went to the same room where Everett and I met the day before. The room was the same: light walls and devoid of anything seemingly technological, except for a phone and fax machine. However, we were able to look out the windows and see the large, cavernous training room, full of computers and three large, blank display screens.

The interview did not last as long as I had anticipated. However, Juan's descriptions of his experience were filled with depth and richness that echoed many of the themes that emerged from Everett's experiences including: apprehension about using the technology; the importance of utility to their decision to accept the technology; the role of the instructors in accepting the technology; the importance of continued exposure to technology; and the motivations for participating in the training.

Initially, Juan appeared apprehensive. Juan completed the informed consent form prior to the interview. Throughout the first half of the interview, I noticed Juan appeared nervous. So, I tried to relieve some of his anxiety by reassuring him that the interview was a conversation and there were no right or wrong answers. As he became more comfortable with the environment and the questions, Juan's anxiety quickly dissipated. Juan began to speak more with his hands and provide richer accounts of his experiences.

Like Everett, Juan had a large amount of experience in conducting and participating in traditional hands-on training and practical exercises. However, he had little experience in using technology in training. However, Juan disclosed that the primary motivating factor for him to attend the training was the anticipated requirements of his future job. At the time he took the training, Juan was about to become a county emergency management coordinator, charged with establishing his community's emergency operations center (EOC).

An EOC is the synergistic result of the combination of a facility, communications equipment, personnel, and policies that support a community's response effort to major disaster incident (Lindell et al., 2007). Proper implementation of an EOC requires a significant amount of resources and training. In the absence of endless resources, innovation is an important capability expansion strategy. This looming task was Juan's motivation to learn from the innovative use of technology from this course:

> I tried to mirror [the training facility] as much as I could. Because, that opened a lot of minds. It opened my mind up to what I knew I could use in my Emergency Operations Center. That was very important. I mean, I had worked in the

> Emergency Operations Center when there was just nothing. No technology. That was it. And, I started using the laptops and I went to the desktops…I built the EOC for the community that I worked for, and I mirrored it to this [the training facility], but it was half that size. (Juan, Q1T11-12)

Terrence

Terrence is a retired police officer in his late 40s. He retired after more than 25 years of experience as a police officer including extensive experience as a SWAT team member and leader, and a bomb disposal technician. After he retired from the police force, Terrence became a full-time public safety instructor based in the United Arab Emirates for a U.S.-based emergency services training organization. He had recently left that position and returned to the United States. At the time of the interview, Terrence had taken a new position as a full-time instructor for the same simulation-supported training program as Everett and Juan. He was new to this position, which required him to instruct a course using the computer-aided simulation.

Terrence stood straight in the classroom and was alert at all times. He was a soft spoken person with an affable personality, but he seemed to be always ready to jump into action. As I observed Terrence before and during the interview, he demonstrated a genuine passion for his job and for teaching public safety professionals. While there were points during the interview that he clearly missed being a police officer, his enthusiasm for teaching and for his new position, shined through.

Terrence was the first person to agree to participate in this study. However, he had to complete the course before he could be interviewed. We met after he completed

the same course that Everett and Juan had instructed. In the days before his interview, I observed Terrence as a participant in the course. He interacted with the technology and the other participants well. He provided a calming and mission-oriented presence throughout the exercises. He shared his experiences with his fellow participants and did not appear to be in distress throughout the course, including the practical exercises.

In contrast to Everett and Juan who had both completed the course as participants several years ago, Terrence was interviewed immediately after training ended. As with Juan and Everett, Terrence and I also went to the small breakout room adjacent to the larger training room. Terrence expressed that he is an experienced user of technology, including computers and SMART phones. He also has a significant amount of experience playing console games with his children. Like the previous two participants, Terrence was an instructor with decades of practical experience. However, in contrast to Everett and Juan, Terrence has also completed multiple online training courses throughout his career. Based on his descriptions of his previous uses of technology, Terrence appeared to be a digital settler.

Terrence was motivated to attend the training by the prospect of gaining more knowledge and to observe and learn the instructor's role in teaching the simulation-supported course. Terrence also differed from Everett and Juan because he that his coworkers were watching his performance.

> Well, I had a little bit of maybe a different take than the normal student as that I was gonna be a part of the program, also. So I felt not only I was evaluating myself in it but I was being evaluated by others at that time. So, that was some of

> the apprehension. But, as far as the technology itself, I initially, again, was concerned that maybe I wouldn't pick it up as quickly as I needed to. But I didn't feel that was the case after we started getting into it. (Terrence, Q3T18)

Rusty

Rusty is a law enforcement officer in his 30s. At the time of the interview, he was employed as a criminal investigator by a county sheriff's department in the southwestern United States. Rusty had been involved in law enforcement for more than ten years. Rusty had ample experience with technology, including using computers, SMART phones and playing console games. He also used multiple tablet-type devices prior to participating in the training. Like Terrence, Rusty had taken multiple training courses online throughout his career. In the three years leading up to the interview, Rusty had completed several courses where iPads were used as a tool in training. Given his extensive and continued use of technology, Rusty's digital personality can be described as a digital native.

Rusty volunteered to be a participant in the study after responding to a request from the instructor of his latest course. Students in technology assisted training courses were provided a short description of this research project with contact information. A training manager distributed the project description to the participants at the beginning of the course. As a result, Rusty agreed to participate in this study. He was sent an email with the demographic questionnaire (Appendix E). Once he completed and returned it, Rusty was recruited as a participant and was confirmed via email (Appendix D). We

established a time for the interview and arranged to meet at the training facility where I worked, as it was the most convenient location for Rusty.

Rusty was interviewed once he completed his 40-hour training. As he arrived, I met him at the door and escorted him to the same room where the other interviews were conducted. Like Terrence, Rusty is the quintessential police officer. He is tall and fit, articulate and alert. He would be a welcome sight for someone who is in need and a menacing presence to a criminal.

As we sat down in the empty breakout room, Rusty was enthusiastic about the use of technology in training. He was also enthusiastic about the training provided by the training organization. Rusty chose to share his experiences from a class he took in which an iPad was used as a primary tool as both an electronic textbook and a photo viewer.

> Actually this was not my first [training organization] class…we'll twist back to my tech class where they issued an iPad. I took a death investigation a while back and they used the iPad as the actual book. (Rusty, Q1T1)

Bobby

Bobby has had a distinguished public service career that included long stints in the U.S. Marine Corps, the U.S. Department of State and as an investigator for a small city in the southwestern United States. At the time of the interview, Bobby was in his early 70s. He volunteered his time as a reserve criminal investigator for a county sheriff's department in the southwestern United States. He had more than ten years of experience in law enforcement. Prior to attending the training, he had not yet used a tablet computer or played console games. However, he had used a smartphone for more

than four years and a personal computer for more than 30 years. Based on his background, Bobby is most likely a digital settler.

While we had been friends for many years, Bobby contacted me to volunteer as a participant in this study after receiving the project description distributed by the training manager of a course he took. As with Rusty, I sent Bobby an email with the demographic questionnaire (Appendix E). Once he completed and returned the questionnaire, it was determined that Bobby met the criteria to participate in this study. We arranged to meet at the facility where I worked, as it was a convenient location for Bobby.

Bobby is not an intimidating physical presence like Terrence and Rusty; however, he is very alert and observant which characterize his role as a criminal investigator. Throughout our discussion, Bobby sat back in the chair, looking comfortable and relaxed. Yet, his attention to details, even while we were talking, was astounding. Bobby is a thoughtful man who has a gift for telling stories. As I listened to his story, I imagined we were sitting on a park bench in the center of town. His storytelling ability was entrancing and his stories were filled with rich detail. However, Bobby's storytelling ability became a bit of challenge for me as I tried to keep him focused on stories related to *his* experiences with innovative technology, rather than any stories he would like to share.

Bobby recalled his recent experience in a training course where an iPad was used support the training as a photo viewing device and as an e-reader for participant manual.

He explained that his motivation for attending the training was to maintain his professional certifications.

> I took it for…three reasons. One, I need 40 hours for my training period. Two, I am interested in and wanted to learn more about photography. I used to be quite accomplished at it, but learning how to use the buttons on the digital are the same but different. And, third, it was free. The attorney general of the great state of [XXX] is paying for it. (Bobby, Q1T1)

Teresa

At the time of our interview, Teresa was a crime scene technician with a city police department. She was in her early 20's and had less than a year of experience in law enforcement. She was a self-professed gamer, but had only used a smartphone and a tablet for about three months prior to her first training class. Teresa recalled a course similar to the ones referenced by Rusty and Bobby, in which an iPad was used to assist the delivery of the content.

I contacted Teresa after a colleague had seen the description of the study circulated in a training course and provided me with her name and her contact information. After a short phone call, Teresa agreed to participate in the study. I sent her an email with the demographic questionnaire (Appendix E). Once she completed this and returned it to me, it was determined that she met the criteria to be a participant in this study. I sent Teresa the interview confirmation email (Appendix D) and we set up a time for the interview. We arranged to meet at her work facility, as it was the most convenient location for her.

I arrived at her headquarters shortly after lunch on the Friday before a major winter holiday. She led me to a conference room in the police headquarters building. As we walked through the building, it was clear that many of her colleagues were on leave or out of the office. The building was deserted and quiet. The walls of the hallways were adorned with motivational posters and briefing sheets used to provide police officers with important information. The conference room was warm and displayed the plaques and trophies that represented the successes of Teresa's department.

Teresa met me wearing a blue tactical uniform; the typical garb of crime scene technicians. She was younger and much less experienced than the other participants in the study; but she looked very confident. She was articulate and intelligent. As we began the interview, Teresa and I discussed the informed consent form. I asked her permission to video record the interview. Teresa said it was fine and we started the interview.

Teresa and I discussed her background with technology during the interview. She explained that she had played video games for much of her life. Teresa's feeling of being from "the generation that is into technology" (Teresa, Q1T4) served as a clear indication of her technological orientation as a digital native. She elaborated on this point later, solidifying her standing as a digital native:

> I have someone in my family who is a technology guru. They basically got the best of everything, the newest versions of everything, so I get to play around a lot with stuff like that. I was already pretty much desensitized when I finally got my hands on one [the technology], got to mess with it. (Teresa, Q5T25)

Categories and Themes

Five categories emerged from the data analysis: (a) individuals' perceptions of technology; (b) individuals' experience with technology; (c) facilitators of technology acceptance; (d) barriers to technology acceptance; and (e) other emerging themes of potential significance. Table 3 presents a summary of major findings from this study. Each category and the corresponding themes are supported by direct quotes.

Perceptions of Technology

This category relates to how the study participants described their functions of and attitudes toward technology before, during, and after using it. Four themes emerged in this category: a) Awestruck; b) Anxiety, frustration, and vulnerability; c) comfortable; and d) usefulness.

Awestruck. This theme refers to the participants' feelings of being impressed or captivated by the technology. The emotion is interpreted as a positive reaction, although not entirely toward the technology. For example, throughout the interview, Everett discussed his experiences as a trainee and as a trainer for his department. He continued to mention his awe of the technology that was used in the course. Not only was he interested in the "laboratory setting" (Everett, Q1T3) that the training facility and environment provided. Everett was also enthralled with the innovative applications of the technology, as well as its usefulness in helping him improve his performance.

> More importantly, I was impressed with the technology and the ICP [simulated incident command post], like most technology in my experience, allows me to either capture vastly larger amounts of information, process that information and

Table 3

Summary of Major Findings

Category	Theme
#1 – Perceptions of technology	
	Awestruck
	Anxiety, vulnerability, and frustration
	Comfortable
	Usefulness
#2 – Experiences with technology	
	Ease of use
	Previous use of /experience with technology
	Created a realistic atmosphere
#3 – Facilitators of technology acceptance	
	Success with the technology in context
	Intervention of the instructors
	Meaningful content
	Personal drive
#4 – Barriers to technology acceptance	
	Apprehension from the need to change from the known practice
	Technology as a distraction from learning
	Negative experience with technology / bias against technology
#5 – Other emerging themes	
	The future use of technology
	Advice to training developers

> deliver that information in a much quicker fashion and in a fashion that [is] recallable and documentable versus the old process of linear-speaking and having no documentation and only being able to reach a certain amount of people. Using e-mail in an ICP was something we hadn't done at that point. And being able to immediately reach out, even in the e-mail sense, within the ICP was not only a big plus as far as effective communication; but it has a recallable aspect of it that we could utilize for post-incident analysis, cost recuperation, a lot of other things like that. So, I was very impressed with the potential of technology as it relates to more effective management on a number of different levels. (Everett, Q1T7-8)

Juan also expressed his amazement at the training environment that was established for the course.

> I was so impressed with everything when I walked in. I'm going, "Wow, take a look at these big screens. What's gonna go on them?" And then, when we started the process [on] the second day, on the third day, you could see. You had a visual of everything going on at that incident. [You had] the ability to track your resources, how they were going, where they were going. (Juan, Q4T25)

Rusty's enthusiasm was due to the use of technology in the classroom and to the lengths that the training organization had gone to include the technology and the equipment needed for implementation in classroom:

> I own several iPads. I know they're not cheap; especially to maintain them and house them on that scale. The first class that I went to, there was almost 50-some people there and they [the training organization] were totally prepared for

> everybody to have the equipment needed. Not only did you have the iPad, you had the accessories that went along with it: the charger, the data cable, and even in this class they had the adapters for cameras. (Rusty, Q1T10)

Like Rusty, Bobby shared his positive first impressions about the training as he recognized that the training organization provided the necessary equipment to properly implement the technology.

> I was surprised, pleasantly surprised, that [the training organization] was able to furnish one to each one of us for this purpose. And I'm sure they have used them for other purposes except photography. But it made the course seem more high tech and more interesting from the beginning because it had something new on it. (Bobby, Q2T11)

After Teresa told me about her experience with the technology in her course, she recalled her initial reaction to the technology used in her class. Similar to Everett, Juan, Rusty, and Terrence, Teresa was enamored with the amount of technology in the classroom. She had a smirk on her face when she explained her amazement.

> Well, I thought, "Oh wow, they've got a lot of funding if they're gonna give us all iPads. And I wonder if I'll be able to take it home." That was my main thought was "There's no way I'm gonna be able to take this home." (Teresa, Q2T13)

Teresa was also impressed with the quality of the technology used in the course she attended.

> My reaction was this is neat. It's great. The screen quality is just amazing. We were able to zoom into our photos and actually blow it up big like if it were on a regular-sized computer screen. And it had a bunch of different apps. We could go to the Internet if we needed to look something up. And it's basically just like a big iPhone, but I like it because the screen is bigger. You don't have to struggle to see something tiny. (Teresa, Q4T17)

Anxiety, vulnerability, and frustration. This theme represented the participants' feelings as they encountered technology used in training. Consistently, the participants experienced feelings of apprehension, being overwhelmed, vulnerability, and frustration.

According to the participants, various sources contributed to such feelings. Bobby expressed the challenges he experienced with the physical manipulation of the technology.

> The iPad uses a single, female, connector plug, very tiny pins and there is an up and a down. But it's hard to see and it was on an angle. Until the very end, [I] never still couldn't plug in the USB adaptor into it or the photo plug adaptor to it without lots of fidgeting and second and third try and so forth like that. So the purely mechanical parts of it were still sort of frustrating. (Bobby, Q2T12)

Despite his confidence throughout the interview, Everett surprised me when he explained that he experienced some anxiety as he was using the technology. Everett attributed his feelings to his age and little exposure to technology during his "formidable

educational years" (Everett, Q2T9). He admitted that initially he felt apprehensive, vulnerable, and clumsy while he was still figuring out how to use the technology.

> I can only relate my performance with my fellow students. And the particular class that I came in there were a lot of young, progressive people in there. Comparatively speaking, I felt very clumsy initially. One example would be when we were going through the actual sim and how to negotiate around the map, draw shapes, and things of that nature. The two people on either side of me were, from my same department - really my same culture - but younger people who were more computer literate. They were flying through it and I was stumbling and clumsy and had to ask for instructor help and subsequent things of that nature. So I felt very clumsy. (Everett, Q3T16)

Juan also experienced some anxiety, although caused by a different catalyst. He was overwhelmed by the massive amount of technology in the training facility; and that he would be expected to use it used to replace what he had customarily done without technology.

> Well, as you know, I attended the very first class, first EIMUC course that was taught here. And, my very first day here, I said, "Man, what did I get into?" Because, I was always accustomed to doing lots of hands-on training. (Juan, Q1T3).

Terrence also admitted that he was initially apprehensive about using the technology.

> Initially….I had a little background. But, as a student coming in…you're apprehensive about: "What all am I gonna need to know? How interactive am I going to be on a personal level with this? And how quickly can I assimilate the technology and make it useable through the class not knowing if I'm behind with other students who may be more familiar or whatever?…As the first scenarios were being started…you get that apprehension about am I doing this right? Am I going to the right pages? (Terrence, Q1T6)

However, his apprehension was triggered by being a new instructor in the program and feeling that many eyes were on him evaluating his performance. Terrence explained that while he could probably function as a student in the class, the added pressure of being an instructor in the program led to his feeling of being overwhelmed. As the interview continued, Terrence disclosed that the sheer amount of information was overwhelming for him as a student in the training.

> The first week when I came in [to work] and it [the simulation] was being shown, [I was] just kind of getting a taste of it. I was thinking, "Oh wow, this is a lot to assimilate." So when I went in as a student, after that first initial involvement and we're doing the afternoon scenario, I was a little bit pensive. When I got to the thing [simulation] and I said, "Oh man, this is a lot to learn." And not only thinking about it at that time as a student, but also [as an] instructor … 'cause I'm thinking, "I got to know everything about this inside and out, not just as superficially as a student." So I kind of had a feeling that I can function as a student. I felt fine doing that, but then now I need to learn this, and that first day

or two after. This is a lot to assimilate in a short amount of time as…So I had both those things going on working. You know, thinking not only as the student side of it, but the instructor side of it. (Terrence, Q4T21)

Rusty's experience with the technology was markedly different from that of other participants in this study. His apprehension, what he characterized as a "cumbersome feeling", did not come from the exposure to the technology; instead it came from being forced to leave some familiar technology behind.

The feeling that I had, it was actually a cumbersome feeling, because everywhere I go, I already have two tablets. I have the ASUS Transformer pad, and I have an iPad. So now that I went to a class that required me to sign-out and be responsible for an iPad. It was a little bit cumbersome, because now I had to leave – you know, the first day I had to leave my devices at home to use that device. (Rusty, Q4T15)

In contrast to the other participants in this study, Bobby revealed that he quickly accepted the innovative technology used in his training, "The iPad was the new gizmo. It, after a few minutes, was just the same as having a notebook or something else" (Bobby, Q2T24). However, Bobby struggled with learning to use the technology that was at the core of the training: a digital camera. For Bobby, this technology presented some challenges.

The whole course itself was devoted to the technology of digital photography. And so, I guess, one of the confusing things was, everyone had to have a digital camera and most had either Canon or a Nikon. Canon and Nikon do everything

> the same as the other one does it; except they have reached some agreement to label everything completely opposite. So every function is given a different nomenclature or, it's called something different. So the technology of the camera itself was, if anything, the confusing part of the learning...So I would say the confusing part of the course regarding technology was the subject matter itself, which was made a little more confusing by everybody using a different instrument at the same time. (Bobby, Q3T25)

Teresa also experienced frustration with the technology used in the training. In her case, the technology did not meet her tactile needs.

> It wasn't the same as having a hard copy in your hand. I like to have the feel of a book in my hand. I can flip to whatever page I need. I can make notes. You can't really do that with an iPad. If you do, you have to open up a little make-a-note-about-this thing and it'll mark it, but it's not the same as being able to just look down and see what you've written. So, it was a little frustrating. (Teresa, Q2T10a)

Comfort. This includes participants' feelings of comfort with and willingness to use the technology. This was interpreted as a sign of, at least, partial acceptance of the technology.

Terrence stated that as his experience with the technology increased, his understanding of the technology's utility enhanced as well. This, coupled with minor coaching from the instructors, eased his apprehension. As his apprehension eased, he

became more comfortable with the technology. As Terrence noted, his comfort with the technology heavily influenced his experience with the technology.

> It was a very user-friendly system. I felt that with just a little bit of guidance, you can work your way around the whole system. I enjoyed it. I actually went from apprehensive on the initial onslaught [laughter] and then felt very comfortable, even less than midway through the training cycle. By the end, you felt like you learned the processes. The simulation, the computer system that was used, truly enhanced the learning experience. I felt very comfortable by the end of it. (Terrence, Q1T10)

Terrence's comfort was also bolstered knowing that the technology was designed by professionals with expertise in his field.

> I liked the thought of it [the simulation] being a system that was developed by professionals and experts in the field. So I expected – I had high expectations for it. Again, I felt comfortable with it fairly quickly into the training. (Terrence, Q2T13)

Everett also became comfortable with the technology as he used it more. As his comfort level with the technology increased, so did his appreciation for the technology's value. As his comfort increased, his initial skepticism also subsided:

> After seeing the success and how much more effective it [the simulation] made me. It quickly erased all that apprehension and initial confusion I may have had, and hence made me more receptive to now different types of newer technologies that come. (Everett, Q2T14)

Usefulness. This theme is used to discuss the participant's appreciation for how the technology helped them enhance their performance (e.g. in training and/or on the job). This is a critical theme as nearly all of the participants emphasized the usefulness of technology multiple times throughout their interviews.

Everett stated that his apprehension and vulnerability disappeared as he saw the utility of the technology in helping him do his job better (Everett, Q1T7). Utility was a recurring theme for him. At several points throughout the interview, he was quick to point out that his exposure to the technologies in his training allowed him to be more receptive to other innovative technologies.

> Once I got comfortable with it, I began to see the value in the daily discharge of routines. That is probably the biggest value that I see now in technology. Both in training and real-life incidents, I'm able to utilize that [technology] and be much more effective on a multitude of levels; not only effective management of incidents, but utilizing lessons learned for subsequent training, being able to document that stuff in a digital sense or whatever. It's just made me a lot more effective and a lot more professional. (Everett, Q1T12)

Juan stated as his exposure to the technology increased, he was also able to understand the utility of the technology and his comfort with the technology also increased.

> The first day was very interesting trying to learn [the] EM*ES program. After the end of the first day, I said, "Whoa!" I'm wondering if I'm going to be able to handle all this." Well, the second day, it worked out a lot easier. I said, "Oh, this

> makes everything run smoother. You can track it [resources] better. There is no large paper shuffle that you have to worry about. The technology itself was outstanding. (Juan, Q1T5-6)

Juan shared that as he continued to use the technology he developed a better understanding of the technology's applicability to his current job. The *utility* of the technology made him more efficient as a large-scale incident manager. This ultimately made it possible for him to improve his job performance, even though he would not see the simulation outside of the classroom.

> Well, again, that very first day was kind of way over my head. The second day, I was able to understand a whole lot more and have the opportunity to use it more. Now, I'll say it simplified the process required to manage the incident itself. We had everything in the computer system: all your resources, you had the process to follow, the [U.S. Coast Guard Operational] planning "P" was readily available all the time just so you could follow that process. (Juan, Q1T9-10)

Later, Juan elaborated on the utility he saw in the technology and why it was important for him to accept the technology.

> I liked it because I had the opportunity to learn something different. Something that I knew was gonna keep moving forward. The old dog and pony show were gone. Now we were driving automobiles and we didn't have to feed them that much. But, the system itself just opened a lot more doors. The availability of [information] if you don't know this answer, shoot to the Internet. You're right back into it. You're done. You've got your answer. You could always find

> resources that you may not know of or you just may have a question on. For example, how much fuel is in a tank? Above ground tank? An oil pit? A refinery? Look it up. One point five billion barrels. I know, because I looked it up. So, it's things like that that just simplifies; it expedites everything. The process where you're not sitting there spinning your wheels. (Juan, Q2T14)

While Rusty had several tablet devices, he had not encountered an electronic book before. However, his perspective was positive.

> I would say I had experience using an iPad. Therefore, it was not a difficult drama for me. I was new to e-books. I did not exactly know how e-books worked. But, once we got in there and the instructor went through the initial, I realized that all it was is just a PDF file and you're just scrolling through it page by page. Once I realized that's what it was I had, a good feel and a handle about what I was experiencing. (Rusty, Q2T12)

Bobby surprised me a bit in our conversation as he explained the importance of the technology's utility in his decision to accept technology: "Yeah. I approve technology. I approve anything that can improve work and make whatever you're doing simpler or better is good" (Bobby, Q5T43). Bobby's practical view continued, "And if it can also be done while costing less, than the previous method, that's even better" (Bobby, Q5T44). These statements also reaffirm what the other study participants have noted to this point: the utility of the technology used in training is paramount to acceptance by the user.

Experiences with Technology

This category consists of the participants' reported experiences with technology. Three themes emerged in this category. These themes are: a) ease of use; b) previous use of or experience with technology; and c) technology created a realistic atmosphere.

Ease of use. This theme addresses the participants' feelings concerning the operability of the technology. Words used by the participants to describe their experience with technology included "intuitive," "convenient," "user friendly," and "easy to use."

Rusty explained that his previous experience with the iPad made the technology easier to use in training, despite that he had not used the technology in the way it was being used in the training.

> My first impression was like, "Wow," because that's not an easy feat to issue 30 to 50 iPads for a class, but I'm very familiar with an iPad. I thought it was very, very beneficial for me as a person; it was user-friendly on my scope. (Rusty, Q1T3-4)

Teresa discussed the iPad's ease of use and how she felt about it:

> It was just the ease of having pretty much everything I would need right there at my fingertips and it was lightweight. It's not like a laptop. I have a laptop. But I have to have a big enough screen; and if you have a big screen, it's heavy. I don't carry it with me because of that; but [with] an iPad, they've compacted everything into this book-sized object. So it's just really convenient in my opinion. (Teresa, Q4T18)

Bobby continued with the theme citing the ease of use of the Apple products being the reason that people like them so well:

> I suspect that there are a few, just as there are a few physical klutzes, who just are not good mechanical things. There's bound to be a few people, who just don't learn technology or new technological devices automatically, intuitively. And this particular colleague of mine is definitely one of them. And so I would suspect that, in any given group, there's gonna be at least one or two people that introducing a new technology into their environment or as a teaching tool or something like that may either be difficult or time consuming or, in the future, even impossible. I don't know. Apple makes things intuitive and it makes things simple; which is why people like it. (Bobby, Q5T55)

Previous use of technology or experience prior to the training. This represents the participant's previous use of, or experience with, technology prior to taking the training that discussed in the interview.

During this interview, Terrence recalled two experiences of encountering innovative technology. His first experience from early in his career was the use of PowerPoint to replace 35 mm slides and transparencies. His second experience was the use of a computer-supported simulation used to deliver scenario-based training. Terrence explains his perspective.

> Through my experience, almost 30 years of being involved in training or teaching, I've gone through from just PowerPoint coming into play all the way back to then. Even then, when we went from slides and just handouts to

> PowerPoint's and the function of that, I thought that was an excellent and great way to start evolving. I personally always liked the evolution of technology in the training field. Now and of course that's got to be driven by the course, itself. What subject matter is being pushed? Specifically thinking about the technological changes recently here at [my training organization] as development of their own software and the pushing of that I think it's excellent…So, to me it has great benefit when used appropriately. Sometimes, there's a learning curve of getting to that point of: When is it too much? Of course, it's a changing generation that's now growing up with constant video feed, you know, in some ways. (Terrence, Q1T1a-b, d)

Terrence continued to frame his experience with a note of caution to course developers about the overuse of technology, even when the technology is a positive addition to the training.

> The way I saw it, we went through kind of a learning process and I think that's common with the technology. Like PowerPoint, we went to where it became too much of a crutch and was used too much. We took away from some of the interpersonal. It was almost detrimental at times when we used too much of it. We'd get away from personal interaction or hands-on training…Sometimes, I like it; but I think it needs to be tempered with some different styles. (Terrence, Q1T1c-d)

Well into the conversation, Rusty explained that he specializes in cybercrimes which requires him to use technology extensively. Rusty also noted that his prior

significant exposure to technology and understanding of the technology's use had a significant influence on his willingness to accept technology.

> Well, actually to be fair, I probably have a bias because I'm a cyber-investigator; I do [investigate] high-tech crimes. I'm actually an investigator assigned to a high-tech crimes unit. Therefore technology is my basic tool of investigation from day to day. Well, I don't want to necessarily say is it's unfair that I have the bias, but I use technology and I find it effective. (Rusty, Q5T17)

Teresa's experience with the innovative technology was pleasant. She indicated that the technology was easy to use and "it wasn't difficult to adapt to at all" (Teresa, Q1T3). She stated, "Because I had had experience with an iPhone before, it made it a lot easier. I guess you could say I'm the generation that is into technology like that" (Teresa, Q1T4).

The technology created a realistic atmosphere. This theme identified participants' perception of the realism created by the technology after experience using the technology.

Everett and Terrence stressed the importance of creating a realistic atmosphere in some training situations. This is not surprising given their work experience and the fact that the course they attended was designed to simulate actual job conditions.

> I actually almost like to separate the technology down into a couple different categories. One was the technology of the simulation which created a realistic battlefield tempo; you felt like the incident was actually occurring. (Everett, Q1T4&6)

Terrence also mentioned the immersive, realistic feel of the training environment, which was due to the technology, at least in part.

> Well, I've been on both sides of it. I've instructed with it; but also attended the class recently myself. And so how that was pushed as a student's viewpoint, I thought was extremely helpful…Now, I can see it and work it as in every area. I can see what all the other students are doing. I can see the consistency that comes from that kind of a system that allowed me as a student to feel immersed in the training. I can feel almost as close as I can get not actually being there. (Terrence, Q1T4)

Facilitators of Technology Acceptance

This category consists of experiences that participants indicate positively impacted their decisions to accept the technology. There are three themes that were identified in this category: a) success with the technology; b) intervention of the instructors; and c) the participants' personal drive.

Success with the technology in context. This theme addresses the participants' experiences with successes in using the technology and how it impacted the decision to accept technology.

Earlier in this chapter, Everett explained the importance of seeing success using the technology.

> Now, I'm seeing the past history of these successes; now when something new comes up, rather than having that initial apprehension, I recall that initial

apprehension. Now, I am much more receptive and more apt to try, with a completely open mind, new types of technology. (Everett, Q2T15)

This success had a lasting impact on Everett's personal appreciation for technology:

> It's [the technology] made me much more open to it because of the success. Initially, the impetus was this training session. The subsequent success in the training session and that three days of training, became the catalyst for me being much more open-minded. Really, that was kind of just the beginning of my department's acceptance of numerous technology tools that we utilize now on a daily basis. (Everett, Q5T23a)

Everett's experiences have also success carried over to his department.

> It's always initially a confusing thing because we're deviating from a past practice. But every single time, we look back after we've used the technology for three or four years. We look back at the old way we used to do it and we literally will laugh out loud of how archaic it was compared to how efficient we are now with the new technology. (Everett, Q5T25)

Juan had a similar reaction after seeing the successes he had in the training.

> Well, the second day it worked out a lot easier. I said, "Oh, this makes everything run smoother. You can track it better. There is no large paper shuffle that you have to worry about and just the technology itself was outstanding, because I've used some of this technology when I'd built my EOC, when I became Emergency Management Coordinator. (Juan, Q1T6)

Role of the instructors. This theme addresses the impact of the interaction with the instructors on the participants' experience.

Everett addressed how the instructors contributed to his experience with the technology:

> The receptiveness of the instructors to be patient and work with me alleviated my reluctance to ask for more help. And then, the subsequent explanations that I needed in demonstrations ultimately helped me learn it better. (Everett, Q3T18)

As we discussed the Juan's experiences with the technology, his experience explained how important the instructor interventions were. He explained how the instructors' assistance eased his apprehension.

> The information you guys [the instructors] provided us simplified the knowledge for me to absorb more knowledge out of that. After the first day, I really felt good about how to use it [the simulation]. I kept falling off the table every now and then, but I'd get right back on the table and the instructor was ready [and] available to provide assistance. (Juan, Q4T23-24)

Terrence also discussed the instructors' impact on his experience with the technology: "I quickly found that it was easily acquired and that with just a little bit of guidance from instructors, by the second scenario you can almost work on your own in those areas" (Terrence, Q1T10).

Personal drive. This theme addresses the impact of the participants' internal motivations that pushed them to work through the frustration, anxiety and confusion created during the encounter with the technology.

Early in our discussion, Juan had discussed his motivation for attending the training. He quickly recognized that he had to change because the technology was quickly entering the workplace. This served as motivation for him to accept the technology:

> The first day was very interesting, because I had to open up and learn the new process, the new tech, the new tech stuff that was coming up. So, you know, I said, "Okay, open mind. We can do this." (Juan, Q1T4)

Terrence shared a similar experience to Juan's. Terrence did not feel like quitting, but he was challenged by the technology. Nevertheless, he was determined that the technology would not beat him:

> Let me think about that for a moment…I can't think of a specific answer and about myself where I just said no. I don't have that personality…I would say, "No, I can't do it." I have – trying to think of a specific incident because I'm sure I have said, "Wow, this is just too much. I need your help some more." (Terrence, Q6bT48)

Barriers to Technology Acceptance

This category consists of experiences that participants indicate potentially inhibited or negatively impacted their experience with the technology. There are three themes identified in this category: a) apprehension from the need to change from the

know practice / resistance to change; b) technology as a distraction from learning; and c) negative experience with technology or a bias against technology.

Apprehension caused by a change away from current or known practices. This theme addresses participants' experiences of anxiety created by the training content requiring change outside of known practices. Everett was very quick to point out that his apprehension was not only due to the technology, but also due to the content of the course pushing him outside of his comfort zone.

> Initially, I felt very vulnerable in trusting the machine or even deviating from my tried and true process that I've established over years and years responding to thousands of incidents. And now suddenly to deviate from that process and utilize the technology, utilize the machine, resulted in that initial apprehension. (Everett, Q2T13)

Like Everett, Juan attributed some of his apprehension to the course content forcing him to rely on a new process that incorporated technology. "You know, what threw me for a loop was, right off the bat, was it's a new system. I've got to learn this." (Juan, Q5T26)

Like Everett, Terrence attributed some of his apprehension to the way that the course stretched him beyond his comfort zone.

> You know I wasn't scared of it. I didn't feel like I would be overwhelmed by it. It just kind of to me felt like a new learning environment and a little apprehensive about how does this all play out. (Terrence, Q2T17)

Terrence also suggested that the unique classroom environment, facilitated in part by the use of the technology, contributed to the apprehension he was feeling as well.

> I think the apprehension probably covers most of what I was feeling. You know some of that is not specifically or completely about the technology. It's just being in a new environment. (Terrence, Q2T15)

Technology as a distraction from learning. This theme encompasses participants' experiences of technology that detracted from the training and its impact on the decision to accept technology.

Everett discussed how glitches with the technology affected his experiences with the technology:

> We've had glitches. After my exposure and employment here, I became an exercise designer back home. I did it for the entire [city] region for about a five-year period. There were technology glitches. Mostly were operator-error type things, not so much concept of technology and how that's applied…My only concern was that sometimes, amongst skeptical students, if we had a computer glitch it kind of left a black eye. Much like my success on a positive note, it could be counterproductive in a negative note if we had some type of glitch that made a less-than-positive training experience from a technology point of view. (Everett, Q5aT27)

Rusty echoed Everett's sentiments. He also felt that the technology can serve as a distraction from the instruction. For example, an iPad that allows the participant to indiscriminately surf the web can be a distraction from the instruction of the course.

> It's more of an entertaining value in that boring part where somebody – and again it does have a negative adverse because now somebody just wants to play with a new gadget and not actually learn. It's kind of a double-edged sword. (Rusty, Q6T23a)

Everett also discussed the experience he had as a course participant, watching how his fellow participants allowed the technology to distract them.

> It [the technology] forced me to be a little more analytical and really pay attention, versus some of the other people that were just flying through it. I think [they] missed some of the instruction because they were steps ahead of the instruction. (Everett, Q3T18)

Negative experience with technology / bias against technology. This describes participants' negative experience with technology, including occasions where the technology failed to meet the needs of the participants, and how these experiences influenced their feelings about the technology.

Teresa surprised me as she intimated that the technology did not have the utility she needed and therefore was not an improvement or enhancement to her training. This led to her frustration concerning the technology.

> It wasn't the same as having a hard copy in your hand. I like to have the feel of a book in my hand. I can flip to whatever page I need. I can make notes. You can't really do that with an iPad. If you do, you have to open up a little make-a-note-about-this thing and it'll mark it. But it's not the same as being able to just

look down and see what you've written. So, it was a little frustrating. (Teresa, Q2T10a)

As we continued with the interview, Teresa was the only participant to reject the technology used in the training.

> In the courses I took after that [first training course], I just didn't use it. I stopped using it pretty much except for pictures. The overhead projector provided all the information I need. They make it to where we really don't have to go back and look stuff up unless we want to. It was meant as a convenience I'm sure. But without learning how to use it or just having a little, maybe, an hour of, "Hey, this is how you use it. This is how you make notes in it." It was kind of pointless. (Teresa, Q2T10b)

Bobby had a co-worker who was not as technologically savvy as he was. In fact, Bobby had become the impromptu technology tutor for his colleague. He helped his fellow law enforcement officer find his user name and password for an old email account; register for and start an online training course; and print documents needed to complete the course. As he recounted this experience, Bobby said, "The point of this is that some old dogs have a great, great, great deal of trouble learning new tricks. And I suspect it doesn't necessarily depend upon age even." (Bobby, Q5T48)

Other Themes of Importance

This category includes three themes that emerged from the data which is not directly related to my research questions. They are: a) meaningful content; b) the future use of technology; and c) the participants' advice to the developers of future training.

These three themes are included in this report because they provide useful insights and values implications for future research and practice.

Meaningful content. This theme addresses the participants' experience with the training content, beyond the technology and how the organization and presentation impacted the participants' decision to accept technology.

Terrence understood that the training content was oriented toward success and felt that because of the utility it offered, people are more likely to accept the technology to better learn the content:

> So I think that's a good point that, even though you can't walk away with our software, everything that we do you can use in a hard copy. So, I think that's a lot of why they really like it better. They can validate it outside of the classroom. The processes…the things they've learned. They can take those processes and put them into action…The knowledge, the process knowledge, is valid outside the room. The electronic forms that we put into the simulation are valid outside of the classroom and useable. And also…you'll see a lot of that in the students' feedback that the simulations were good and that they could actually say this is something we may encounter. And that, again, makes it something they can use outside of the classroom. If they thought that this was a simulation, it really is not valid or it only happened here, then you're losing a lot of the instructional and learning value of it. But if they think that can happen all right and it has happened now that it's a takeaway for 'em. (Terrence, Q6dT62)

Future use of technology. This theme encompasses the participants' suggestions for the future use of technology used in training.

The training, specifically the success with the innovative technology, had a significant effect on Everett and his willingness to accept innovative technologies. He not only accepted the innovative technologies used in the training course he took; he has become an advocate for using technologies in his job. He now works to encourage others to accept innovative technology.

> I was totally opened and even now I still see huge reluctance amongst the [my department's] membership when that initial confusing phase of a new technology tool is introduced. What I can do is I usually point back to the confusion…So, the impetus I think was my success here with the new technology which created a much more just open-mind environment towards being introduced to new technologies. (Everett, Q5T23b-25)

Juan shared his vision of how innovative technology would be used in the future workplace.

> The technology that I saw here [in the course] really pushed me to learning more about the technology, about the electronic, computer systems. Because, you can forget paperwork. I mean, it's gonna be on tablets...And you're not gonna be killing anymore trees. So, I really reached out to getting more knowledge of new technology coming out, and new programs, of course. (Juan, Q5T30)

Advice to developers. This theme encompasses pieces of advice from the participants to developers and managers of future training courses who would potentially incorporate technology into the training.

Near the end of the interview with Juan, provided sage advice to training developers and training managers concerning the use of technology in training.

> User friendly. It's got to be user friendly. Because, if it's not user friendly, you're gonna get some individuals who do not have a lot of knowledge on computer usage or programs on the computer that would benefit them. They're gonna fight you on it. In some cases, some of those individuals just jump right in and go, "Hey, trial and error, trial and error. That's all I can do. I can't fail on this system. I can't mess it up." My big thing is user friendly. It's got to be user friendly. (Juan, Q6T32)

Terrence offered his recommendations to developers about how to best implement technology into training. He suggested that the technology should be focused in training and not added simply to show off the technology. According to Terrence, the latter situation often becomes a distraction to learning.

> I'll fall back to some of the things that I think of as far as what makes training *exceptional* training. The use of the technology is not overwhelming to the delivery. I would like to think the technology being used, whether it's the iPads or whatever, that the students don't become just immersed in the use of a new-fangled piece of equipment and they're losing some of what's being delivered to them in the course, itself. You see that sometimes when you bring a new toy or

> tool into an environment, people will just concentrate on that. Well yeah, that's a neat system, a neat computer or whatever, and they sometimes walk away and it feels like that they didn't really grasp some of the things we were trying to get across to 'em as far as what they need for their abilities and their jobs. So, to clarify that just a little better, I think the technology and the way it's going almost [in] every instance has its positives and negatives. And we as instructors and trainers have got to see where those are. "Where's the positives?" "Where's the negatives?" "When is the utilization of the PowerPoint's or the ipads or the videos, anything we're able to inject has that now become too much of a wow factor as opposed to solid instruction?" And sometimes I'll see instruction and I'll think that they're just glitz and glamour and they're trying to impress in the technological advances of their technological abilities, but the depth of instruction lacks and they try to make up for it in these other realms. So, that's my take on it, that it's excellent until it's overused and you're not delivering material. You're delivering show. Does that make sense? (Terrence, Q6T28)

Terrence continues this thought by reinforcing that instructional designers, instructors, and training managers should understand that trainees are all over a spectrum of technological proficiency. Therefore, he suggests the following.

> In our technological advances I think we sometimes leave students behind because we don't make it basic enough. I would say that to some developers please don't develop it as though it's you or even your half-life coming in to take this course. Give us something that the basic student coming in who has very

little or has a built-in bias ‘cause it’s new to them and gets ‘em outside of their comfort zone. Let’s make it so that they can come in and that’ll usually once they get over that mental block that they can’t do it, will pretty quickly catch up to where you need to be. But if it’s just immediately overwhelming and you leave ‘em there, you’ve lost ‘em for the whole training. (Terrence, Q6aT46-47)

Rusty explained how important it is to ensure that the technology does not interfere with learning that is to take place during the training.

It’s very effective because learning itself has advantages and disadvantages. You’re trying to convey something to a person trying to learn, so they have no concept what you’re trying to teach them. Until they get that depth of understanding [and] the light bulb goes off. It’s like “Oh, now I get it.” By using technology you’re able to incorporate more vivid tools. I’ve heard time and time again somebody’s like, “You know, I can read it but I don’t understand it until I see it.” Or, people who have learning disabilities with reading, dyslexia; that stuff comes back out. When they have a visual tool the only visual impairment that, you know, somebody would have would be eyesight, and that’s kind of a little bit more limited on a learning ability. So the visual aspect of it is greatly enhancable; I would say that would be the one thing I’d recommend is keep that focus in mind because that’s very detrimental in education. (Rusty, Q6T23)

Like the other participants, Bobby offered some advice to developers and managers of training regarding how to design courses using innovative technology to increase the potential for technology acceptance. His message to the developers was

clear: “Don’t make it so complicated that it distracts from the course material, or make its [the technology’s] use in any way distracting from actually the course material” (Bobby, Q6T66). He also reiterated a common theme that resonated with many other study participants: keeping the technology easy to use.

> KISS, keep it simple stupid. Whatever technology is being used [should] not require extensive training to use it by the student. It may require a lot of new training to use it by the instructor, but they are paid to do that and have time to do it before the course starts. I suppose don’t assume that everyone immediately already is at your level of technology to begin with. Survey or have some way of finding out if everyone is familiar with the basic concepts of the technology that you’re going to be using. (Bobby, Q6T61)

Teresa offered her advice to the training developers and managers as well. She stressed the importance of having a choice in using technology is to trainees.

> I don’t want to say that they should have to print us off a hard copy of it. I like the ease of having the books in a thumb drive, so I don’t have to carry around a big old hard copy. But I feel like we should be given a choice…Because I feel like some people feel like they may be forced into this new age of technology…Technology, to me, is very productive. It’s more helpful than it is a hindrance. But if you just have a certain mindset, you’re not going to be willing to accept it. Which is why I think if they don’t give us a choice; if they would teach us at the beginning of class how to use it to our advantage; it might be

easier for people who are more traditional to get acclimated to it. (Teresa, Q6T31-34)

Chapter Summary

This chapter presented the lived experiences of six public safety professionals with varying levels of experience with technology. Each of these professionals attended a training course that used innovative technology to support the training delivery. The trainees' experience reflected that trainees experience a variety of emotions, including anxiety as they encounter innovative technology used to support training. Their experiences also indicated that instructors have an important role in affecting the perceptions of technology used in training. However, after the trainees had an opportunity to use the technology, they understood the utility of the technology used as it relates to helping the trainees achieve their goals. Their experiences indicated that they became more comfortable with the technology as they had the opportunity to use it. Participants in the study also offered advice to training developers and training manager concerning how best to incorporate technology in future training courses.

CHAPTER V

DISCUSSION, RECOMMENDATIONS, AND CONCLUSIONS

The purpose of this study was to understand the experience of public safety professionals using innovative technology in a training context. I interviewed six public safety professionals who used innovative technology in a public safety training context for this study. I used a hermeneutical phenomenological approach to explore the lived experiences of the participants (van Manen, 1990). This study was guided by a single research question: *What is the experience of public safety trainees who are required to use innovative or emerging technology in face-to-face training?*

The first section of this chapter discusses six conclusions based on an analysis of major findings derived from lived experiences of six public safety professionals revealed in Chapter IV. Next, this chapter presents a new conceptual framework that explains the actions and reactions that participants take as they use innovative technology in a training context. The chapter concludes with recommendations and implications for research and practice.

Discussion

I drew six conclusions from a detailed analysis of the major findings revealed in Chapter IV as follows:

1. An individual's perception of innovative technology in a training context influences his or her decision about accepting or rejecting the technology.
2. Individuals' learning anxiety is intensified when using innovative technology in a training context.

3. Exposure to and early success in using innovative technology are essential to the individual's continued use of it in a training context.
4. Individuals must experience the utility of innovative technology to continue using it in a training context.
5. Role models play a key role in individual's continued use of innovative technology in a training context.
6. An individual's digital personality does not appear to influence technology use in a training context.

Table 4 describes the essence and contribution of each conclusion. Each conclusion is discussed below in detail.

Table 4

Summary of Six Conclusions of the Study

Conclusion	Essence	Contribution
1.	The professionals experienced a progression of perceptions as they used innovative technology in a training context. These perceptions influenced their decision to continue using the technology.	This new contribution addresses a gap within the extant literature: the influence of individuals' perceptions of technology based on *their experiences* with the technology and the impact the perceptions had on their decision to continue using the technology.
2.	Individuals experienced increased learning anxiety as they began to *learn* and *use* the innovative technology.	This is a new contribution that explains how learners experience increased learning anxiety and its influence.
3.	Activities that allowed the individuals to experience early successes (i.e., accomplish simple, relevant training tasks) with the innovative technology provided the individual with the motivation to continue the use of the technology.	This is a new contribution because it explains the significance of individuals' *experience* with the innovative technology and the importance of the placement of activities that fosters this experience.
4.	When an individual used an innovative technology in a training context to attain his or her learning goals (i.e., utility), he or she will continue using the technology in the training context.	This is a new contribution because it explains the significant impact that individuals' exposure to innovative technology. The role of exposure to the technology is not addressed in the extant literature.
5.	Role models played an influential role in an individual's continued use of innovative technology in a training context by assisting the participants in discovering the utility and easing their learning anxiety.	This is a new contribution to the technology acceptance literature because it defines the role models' (e.g., instructors, technologically savvy peers, etc.) role in an individual's acceptance of the technology in a learning context.
6.	Exposure, not digital personality, influenced the continued use of innovative technology.	This challenges the popular assertion that age or generation is an indicator of an individual's willingness to accept technology. This is consistent with some technology acceptance literature.

Conclusion #1. An Individual's Perception of Innovative Technology in a Training Context Influences His or Her Decision About Accepting or Rejecting the Technology

The first conclusion of this study is that an individual's perception of innovative technology in a training context influences his or her decision about accepting or rejecting the technology. Figure 4 provides a graphic representation of the progression of emotions experienced by the professionals in this study as they used innovative technology in a training context. The participants' experience began with a feeling of awe and amazement and quickly changed to anxiety as they encountered the technology in context, realizing that their performance in the training would be, at least in part, contingent on how well they used the unfamiliar, innovative technology. However, as the individuals' exposure to the technology increased and they experienced successes with the technology in context, their confidence grew and they became more comfortable with the technology. The consistency of this progression of emotions among the participants was greatly unexpected.

The participants used words such as "wow" (Juan, Q4T25; Teresa, Q2T13) and "impressed" (Everett, Q1T7; Juan, Q4T25) to express the awe and amazement as they saw the technology as they entered the classroom. While awe and amazement were the initial impressions of the participants, they appear to have left a lasting, positive impression on the training participants. These observations allowed the professionals in this study to form lasting, favorable opinions of the technology. These opinions appear

to have carried the participants through the later challenges of using the innovative technology in context.

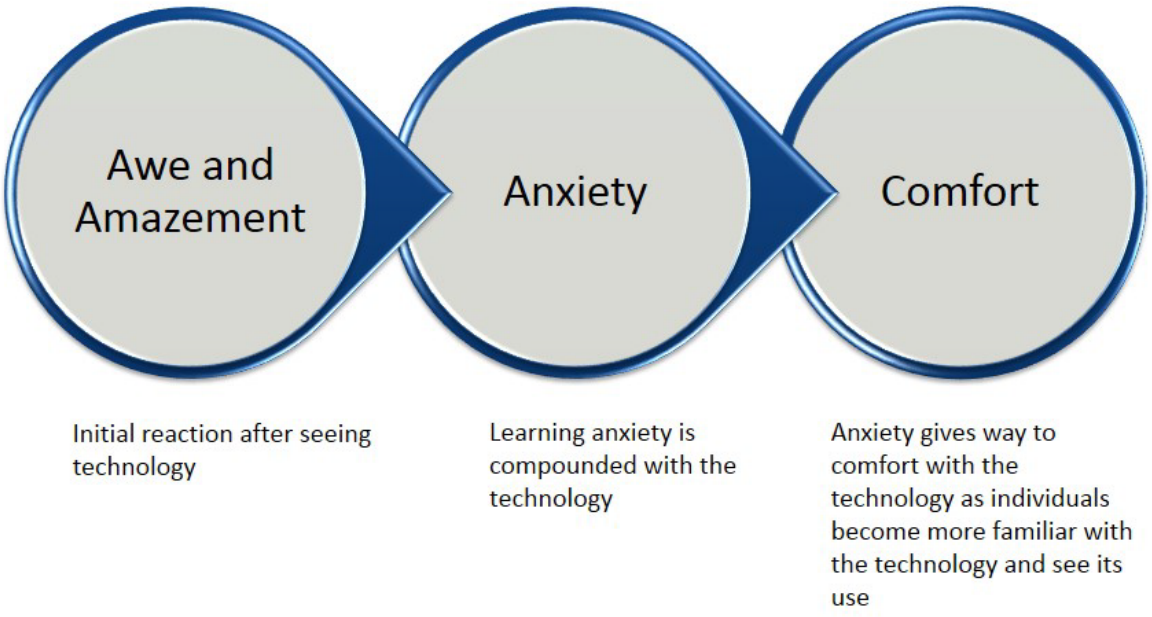

Figure 4. A progression of the individuals' perceptions of technology

This consideration of the impact individuals' perceptions have on their decision to accept or reject technology is a new contribution to the technology acceptance literature. As reported in Chapter II, the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), suggested that a primary determinant of technology acceptance is an individual's perception of the technology's ease of use. Specifically, if an individual feels that the technology is easy to use, he or she is more likely to use it. It is equally plausible to expect that an individual would likely discontinue the use of the innovative technology if he or she experienced it and found it difficult to use. However, neither UTAUT (Venkatesh et al., 2003) nor channel expansion theory (Carlson, 1995; Carlson & Zmud, 1999; D'Urso & Rains, 2008;

Germonprez, 2002) take into account the impact of emotions such as awe, anxiety, or comfort on the users' perceptions of ease of use.

Given the influence of the individuals' perceptions on accepting the technology, instructional designers must ensure that training courses do not require the training participants to do too much too soon with the technology. Moreover, care must be taken to ensure that training participants are properly and adequately equipped with the knowledge and skills to use the innovative technology in the training context.

Conclusion #2. Individuals' Learning Anxiety is Intensified When Using Innovative Technology in a Training Context

The second conclusion of this study is that an individuals' "learning anxiety" (Schein, 1996) is intensified when using innovative technology in a training context. As reported in Chapter II, Schein (1996) suggested that this "learning anxiety," or a restraining force that occurs when a learner encounters valid and relevant data that challenges what was once held to be true, is expected in learning environments. As indicated by Figure 4, the professionals reported that their perceptions of awe and amazement quickly gave way to anxiety as they began using the innovative technology. Specifically, the professionals' anxiety appears to be stimulated by the use of the technology, especially as they were *learning* to use it. As reported in Chapter IV, participants used terms such as "vulnerable" (Everett, Q2T13), "apprehensive" (Terrence, Q2T17), "cumbersome" (Rusty, Q4T15), and "frustrating" (Teresa, Q2T10a) to express the anxiety they experienced. The participants' detailed description, coupled

with their body language while they were recounting the experience, clearly demonstrated that this anxiety was beyond the typical learning anxiety.

This is not surprising when considering that the learning taking place is two-fold. First, professionals are learning the content of the training course that often challenges their beliefs. Secondly, the participants are also learning to use the innovative technology, which may also be a change from the typical learning style. This is, at minimum, an increase in the individuals' learning anxiety.

If action is not taken to mitigate this anxiety, the use of innovative technology could very well stand in the way of the individual learning the material central to the training; therefore, the learning anxiety can (and should) be mitigated. Strategies can be employed by training professionals to mitigate the intensified learning anxiety.

In this chapter, I will discuss two such strategies that the findings have shown to be effective in mitigating the learning anxiety: creating activities that allow individuals to experience success using the technology in context and employing instructors as change agents and opinion leaders.

Conclusion #3. Exposure to and Early Success in Using Innovative Technology Are Essential to the Individual's Continued Use of it in a Training Context

The third conclusion addresses the importance of an individual's exposure to the innovative technology in a training context as he or she identifies the ease of use, or "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450). While this may appear to coincide with the technology acceptance emphasizing the significance of the ease of use literature presented in Chapter II (F. D. Davis, 1986,

1989; F. D. Davis et al., 1989; Venkatesh et al., 2003), the emphasis of this conclusion is based on the actual *experience* of individuals and not their perceptions of a future experience. Moreover, the extant technology acceptance literature fails to adequately explain how users of technology are to discover the ease of use. The findings from this study provides some insights.

The findings presented in Chapter IV clearly indicated that the participants' first-hand experience with the technology is a powerful tool in discovering the technology's ease of use. By using the innovative technology, participants in this study were able to gauge the difficulty of using the technology and weigh that difficulty against the level of investment that they were willing to make to learn the technology. As they were further exposed to the technology, they described what they had previous identified as the cause of their anxiety as "user friendly" (Juan, Q2T16), "intuitive" (Bobby Q1T1), and "convenient" (Teresa, Q4T18). They cited the opportunities they were given to use the technology in context and the subsequent successes they experienced as a primary reason for their evolving comfort with the technology. These successes, although they are comparatively small, appeared to serve as motivators for the participants as they used the innovative technology.

These findings led to the next conclusion of this study: participants' exposure and early success while using the innovative technology are essential to the individual's continued use of innovative technology in a training context. This conclusion is new information because the value of positive experiences with the technology is not clearly addressed in the extant literature.

This is important for instructional developers because it identifies the importance of designing activities early in the course that encourage use of the innovative technology in context. Moreover, this conclusion indicates that activities placed early in a course must be designed to allow training participants the opportunity to enjoy successes. Additionally, these activities should occur early in the training before the training participants' skills using the technology are tested.

Conclusion #4. Individuals Must Experience the Utility of Innovative Technology to Continue Using it in a Training Context

The fourth conclusion of this study asserts that individuals must experience the utility of innovative technology to continue using it in a training context. As discussed in Chapter II, the UTAUT (Venkatesh et al., 2003) claims that a user's perception of the technology's utility is an important predictor of an individual's acceptance of the technology; however, the literature does not discuss how individuals discover this utility. My findings support the assertion in the extant literature that the individual's understanding of a technology's utility is important to predicting an individual's acceptance of technology (F. D. Davis, 1986, 1989; F. D. Davis et al., 1989; Venkatesh et al., 2003). However, my analysis of the findings presented in Chapter IV go further than the aforementioned technology acceptance literature by proposing that individuals must *experience* the utility of the innovative technology to continue using it in a training context. In other words, the findings in Chapter IV indicate that an individual simply being *told* about the utility is not enough for their acceptance; they must *experience* the technology's utility to continue using it.

This conclusion provides insight into the design of training using innovative technology. This assertion that utility must be experienced by the training participants makes a strong case for experiential activities showcasing the technology's capability to assist individuals in attaining their training goals. This also means that the innovative technology in training must have a purpose focused on improving the participants' performance in the training.

Conclusion #5. Role Models' Play a Key Role in Individual's Continued Use of Innovative Technology in a Training Context

The analysis of the experiences of professionals interviewed for this study have identified many facilitators who can potentially influence the individuals' continued use of innovative technology in a training context, including (a) relevant content, (b) a solid course design, and (c) adequate preparation of the technology used. However, the participants in this study have consistently identified role models (whether instructors or their peers), as key to their continued use of the technology.

In Chapter II, role models (Schein, 1996) were described as having two possible, but distinct roles in facilitating change: (a) a formal role or "change agents" (Rogers, 2003, p. 27) and (b) an informal role or "opinion leaders" (Rogers, 2003, p. 27). Clearly, instructors are placed in a formal role of authority with the intention of facilitating change "in a direction deemed desirable" (Rogers, 2003, p. 27) by the organization. However, in many cases, when instructors are members of the same social system as the professionals and have a higher technical competence, they can function as an opinion leader.

As a change agent in a training context, instructors guide participants to use the innovative technology to accomplish learning goals. In other words, the instructor-as-change-agent should be able to close the deal on the use of the innovative technology with the participants in the training context. Instructors are able to accomplish this through teaching and coaching the participants on the use of the innovative technology.

As an opinion leader, the instructor is uniquely positioned to influence the participants to continue using the innovative technology based on their membership in the same social system. He or she is able to influence the course participants as peers by mentoring them. In each role, the instructors are able to encourage and persuade the participants by demonstrating the ease of use and assisting the participants in finding the utility of the innovative technology.

This conclusion is important because it identifies role models, whether as opinion leaders or change agents, as influential to the individuals' decision to continue using technology. Instructors are uniquely positioned to facilitate change, mitigate and even alleviate the participants' anxiety, and help the training participants identify the ease of use and utility of the innovative technology. This puts the instructor in a very powerful position and makes him or her an important part of ensuring technology acceptance. Given this, training managers must ensure that instructors who use innovative technology are well prepared to use the technology. Otherwise, instructors can dissuade individuals by showing their incompetence with the technology.

Conclusion #6. An Individual's Digital Personality Does Not Appear to Influence Technology Use in a Training Context

The final conclusion of this study addresses the popularly held belief that an individual's generation or age influences his or her willingness to accept an innovative technology (Palfrey & Gasser, 2008; Prensky, 2001b, 2001c; Tapscott, 2009). This belief proposes that individuals of recent generations (e.g., Generation Y), the people Tapscott (2009) calls "Net Geners," will accept innovative technology willingly. As Tapscott (2009) states, "young people just breathe it in" (p. 19).

There is no evidence from this study to support that age or generation provided any influence to participants' decisions to use the technology. In fact, findings from this study suggest quite the opposite. All of the participants continued to use the innovative technology despite their initial anxiety; only one participant was part of the younger generation. To add to this, the lone member of Generation Y interviewed for this study admitted:

> It wasn't the same as having a hard copy in your hand. I like to have the feel of a book in my hand. I can flip to whatever page I need. I can make notes. You can't really do that with an iPad. If you do, you have to open up a little make-a-note-about-this thing and it'll mark it, but it's not the same as being able to just look down and see what you've written. So, it was a little frustrating…In the courses I took after that [first training course], I just didn't use it. I stopped using it pretty much except for pictures. …It was kind of pointless. (Teresa, Q2T10a&b)

This final conclusion is significant to training professionals because it begins to dispel the myth that one generation is predisposed to accepting technology. As a result, training designers and instructors should proactively seek effective instructional techniques to facilitate adoptive strategies, rather than assuming technology would be automatically accepted by a younger audience.

A New Conceptual Framework

As presented in Chapter II, the UTAUT (Venkatesh, 2003) is an analysis and distillation of eight different theories and models related to technology acceptance that presented a common framework including a three-step process that explained technology acceptance. The steps of this process are (1) the individual's reaction to using technology, (2) an intention to use the technology, and (3) the actual use of the technology (Venkatesh et al., 2003). Similarly, Rogers (2003) presented a five-step innovation-decision process explaining how social systems adopt or reject innovation. The stages in this process are (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. In addition to the adoption of technology and innovation, Schein (1996) broadened Lewin's three-step change model to explain learning as change. I applied these processes and models in this study to provide a conceptual framework of individuals' *experience* when encountering and accepting innovative technology in training applications. However, these theories and models did not adequately explain the process of adaptation and adoption described by the trainees who participated in this study.

For example, the technology acceptance process outlined in the UTAUT (Venkatesh et al., 2003) and the technology acceptance model (F. D. Davis, 1986, 1989; F. D. Davis et al., 1989) explain the phenomenon of technology acceptance from a predictive perspective. In other words, the UTAUT and other technology acceptance literature focused on identifying the determining factors of technology acceptance. However, the literature did not examine technology acceptance as a phenomenon of change and, therefore, failed to explain or anticipate the anxiety described by the trainees in this study.

Additionally, the UTAUT included Moore and Benbast's (1991) adaptation of Rogers's diffusion of innovations as part of the meta-analysis. However, it failed to include certain factors that are critical to the diffusion of innovations (i.e., the role of the change agent, the role of the diffusion networks, and innovator and adopter categories) (Rogers, 2003). In addition, the UTAUT does not provide a process that describes how change occurs as individuals encounter and decide whether to accept or reject an innovation.

On the other hand, Rogers's diffusion of innovations does provide a strong model that explains individuals' experience as an innovation is adopted throughout a social system. Rogers (2003) also identifies factors that are important to the adoptions and institutionalization of an innovation, such as (a) the role of the change agent, (b) the significance of the channels in which the innovation is communicated within a social system, and (c) the characteristics of the adopter. Finally, Rogers provides five attributes of innovations that can be used to identify the adoptability of the innovation.

However, Rogers's innovation-decision process ends when the innovation is institutionalized within the social system. While institutionalization is appropriate when the innovation will be used beyond the classroom, it is not appropriate in cases when institutionalization of the innovation is either not the goal or not likely. This is the case when innovative technology is used to facilitate training.

Rogers (2003) also presented two separate roles for change agents: the change agent (a confederate to the organization seeking the desired change) and the opinion leader (an informal influencing position). As mentioned earlier in this chapter, these roles reflect the instructors' role in the shared experiences of the participants in this study.

The six conclusions presented in this chapter are based on the experiences of the public safety professionals participating in this study and showed a pattern of actions and reactions of the participants as they used the innovative technology. I have taken this pattern of actions and reactions and developed a conceptual framework to explain the experience of public safety professionals as they use the innovative technology. Figure 5 provides a graphic representation of the professional's actions and reactions, as well as possible points where role models can intervene. This framework has points of connection with the extant literature and also provides insight into the order of experiences leading to a decision to accept or reject the technology. Each stage of the model is described below.

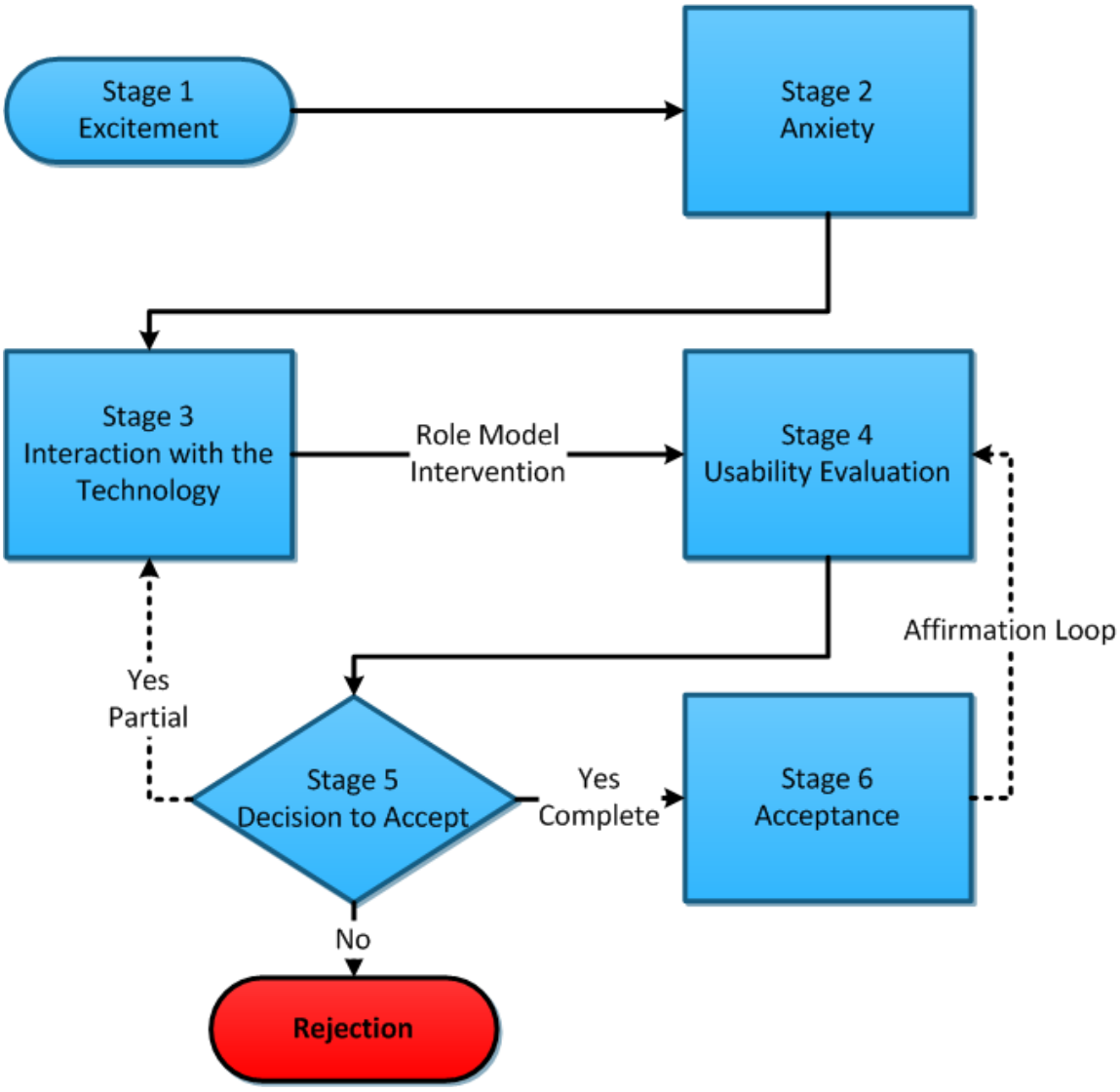

Figure 5. A new conceptual framework that illustrates the process experienced by individuals encountering innovative technologies.

Stage 1: Excitement

This introduction may occur before trainees ever enter the classroom or well after they have started the training. In addition, the introduction may range from word of mouth from previous participants, to a simple unveiling of the technology or a detailed demonstration of the technology's capabilities. A key point is that the beginning of this stage is unpredictable and may already be in progress when trainees actually enter the classroom or encounter the technology.

In this stage, trainees are briefly introduced to the technology and will likely experience the feeling of awe and amazement. This corresponds with the awe and amazement described in Conclusion #1. These feelings are likely resulted by the anticipation of using the innovative technology. However, these feelings may be based on false expectations created by inaccurate or incomplete information.

At this stage, trainees do not actually interact with the technology. In this stage, it is likely they obtain inadequate information about the innovative technology through sources such as course advertisements and previous training participants. This stage is similar to Schein's (1996) disconfirmation and Rogers's (2003) knowledge stage.

Stage 2: Anxiety

As a result of the incomplete information and little or no interaction with the innovative technology, trainees experience varying levels of anxiety that can manifest in ways such as frustration, anger, confusion, loss of self-esteem, and even a loss of self-efficacy. The intensity of this is likely to be in direct proportion to the perceived threat to the individual created by the change. For example, if the trainee perceives that

accepting the innovative technology is a great threat to his or her identity or self-esteem, the intensity of the anxiety may be greater. This anxiety, similar to Schein's (1996) learning anxiety, can lead trainees to resist the innovative technology if it is not mitigated.

Stage 3: Interaction With the Technology

In this stage, trainees are given an opportunity to interact with the technology first hand. This allows them an opportunity to confirm or disconfirm the information already provided in the previous stages. Additionally, trainees are able to begin gathering data that will later inform their technology acceptance decision. This stage should be part of the training instruction and facilitated by instructors who may perform as opinion leaders, change agents, or in both roles.

To aid in facilitating this stage, training activities in this stage should be designed to communicate information so that trainees are able to familiarize themselves with the technology. This stage should also allow trainees opportunities to gain some initial experience with the technology; therefore, context is important. Providing trainees opportunities to experiment with the technology in the same or similar context to how it is used in the training will likely lead trainees to form their own positive opinions and beliefs about the technology. In addition, instructors should allow time for experimentation with the technology. These activities are essential in *selling* the innovative technology; this should not be taken lightly.

The role model intervention. The role models, whether functioning as opinion leaders or change agents, are important to facilitating training experiences and

influencing the technology acceptance decision. As previously mentioned, instructors are often placed in the role of a change agent or, at minimum, an opinion leader. In these roles, instructors are uniquely positioned to make a moderating influence against the aforementioned learning anxiety and can reduce or eliminate the resistance to the technology as a result of the learning anxiety. To do this, instructors must be capable of coaching and mentoring trainees as they use the technology. While this is particularly important in the early stages of the process, instructors must be prepared to perform at any stage throughout the training to prevent disconfirmation.

Stage 4: Usability Evaluation

The usability evaluation stage begins once trainees have had opportunities to interact and become familiar with the innovative technology. In this stage of the process, the trainees continue to gather data about the technology that will inform their decision to accept. There are two types of data that are gathered: utility data and ease of use data. *Utility data* is information that signals to trainees that the innovative technology will assist them in improving their performance. *Ease of use data* is information that demonstrates to trainees that using the innovative technology would be relatively free from effort and that they can effectively use it.

Trainees gather this information and make judgments about their ability to use the technology to accomplish the goals of the training. This is the probable location where Schein's (1996) concept of cognitive restructuring occurs. As the data are gathered and processed, trainees are redefining what they previously understood, including their abilities to perform with the technology.

It is important to note that learning anxiety is likely to occur in this stage, especially if there is a threat to the trainees' self-esteem or self-efficacy in the classroom. If learning anxiety occurs and is not moderated by the instructors or other opinion leaders (e.g., other trainees), then there is a possibility that the trainees will reject the innovative technology; however, if the trainees identified the technology as an enhancement to their performance and observed that the technology is relatively easy to use, then the likelihood the innovative technology is accepted is increased.

Stage 5: Decision to Accept

At this stage of the process, the trainee has gathered and processed the usability data and must now make a decision to reject, partially accept, or fully accept the technology being used in the training. Rejection occurs when the trainee rebuffs the technology used in the training. This often results in the trainee disengaging from the training. In fact, rejection may occur before a participant ever enters the classroom, meaning that the trainee does not attend the training. Rejection of the technology may manifest in the form of the trainee leaving the classroom, taking on tasks that are devoid of the technology, or engaging in disruptive behaviors to avoid the technology. It can also manifest as the trainee stating that he or she will not use the technology or intensely criticize the technology. While none of the participants in this study appeared to reject the technology used in their training, it does occur (as other studies reveal). Rejection of the technology terminates this process.

Partial acceptance occurs when the trainee uses the technology, but requires additional exposure to the technology and/or more interaction with the role model(s).

The trainee has made a tentative acceptance of the technology, but could still reject the technology if his or her needs are not fulfilled. When partial acceptance occurs, the trainee may still be hesitant to engage the technology on his or her own or continue to require a significant amount of coaching. When partial acceptance occurs, the trainee will seek out more exposure to the technology and repeat the usability evaluation to confirm his or her understanding of the technology's utility. This will recur until either the trainee decides to fully accept or reject the technology or the use of the technology is no longer required.

Full acceptance occurs when a trainee embraces the technology without further anxiety. He or she may not use the technology error-free, but the trainee is willing to engage the technology without reservation. When full acceptance occurs, the trainee advances to the next stage: acceptance.

The decision point varies based on the individual. The participants in this study indicated that the decision stage often takes place early in the training evolution. Moreover, there is not a single indicator that the decision stage has begun or ended. Perhaps the most expected visible sign is that the trainee is using the innovative technology; however, this can be deceiving because trainees may still be in the interactive stage or usability evaluation stage.

Stage 6: Acceptance

Acceptance is the last major stage in the process; however, because institutionalization of the innovative technology is unlikely, the process may not end with this stage. Acceptance begins once the individual decides to accept the innovative

technology and he or she decides to use the technology to its fullest extent. This stage continues as long as the innovative technology is used in the training.

Trainees continue to receive and process the two previously mentioned types of data, utility and ease of use, to reinforce their decision to accept the technology. However, in this stage, information may be presented that challenges the trainees' beliefs about the innovative technology. When this occurs, the trainees are likely to enter a period of re-evaluation or seek reconfirmation of their decision. To accomplish this, data are gathered and processed and the trainees repeat the usability evaluation and decision stages until they reconfirm their decision to accept or, in some cases, reverse their decision. If the decision is reversed, the innovative technology will be rejected.

The instructor, as a change agent, has a significant role in moderating the effects of this disconfirming information and mitigating the potential rejection. To be effective at this, the instructor must be capable of recognizing the trainee's learning anxiety, which will often manifest as frustration, confusion, or apprehension. When this is identified, the instructor must intervene as necessary to answer questions and mitigate the anxiety to prevent reversal of the acceptance decision and the subsequent rejection of the innovative technology.

In summary, this section has presented a new conceptual process, illustrated by Figure 4. This model explained the experiences of trainees as they encountered and decided to accept innovative technology. I constructed the model based on the experiences of the trainees who participated in this study. The conceptual process explained what trainees experience as they encounter innovative technology used in a

training course. The process identifies points where instructors, acting as opinion leaders and/or change agents, are able to intervene to facilitate the trainees' acceptance of technology.

In addition, this process identifies areas in the design of training where instructional designers and training mangers can build activities to allow training participants opportunities to experience the utility of the technology as it enhances their performance in the training course. This conceptual framework offers a unique lens to conceptualize the trainees' experience as they encounter innovative technology. It is informative and helpful to instructional designers, training managers, and instructors who develop training that uses innovative technology.

Researcher's Reflection

The Impact of My Biases

As mentioned in Chapter III, I recognized several sources of my potential bias: my long and vast experience as a first responder; my professional experiences as an instructor and developer of training, and my status as a self-proclaimed techno-geek. Throughout the dissertation research process, I have reflected on how these potential biases may have impact my understanding and interpretations of the participants' experiences as they encountered the innovative technology. In what follows, I have attempted to acknowledge these impacts.

I have had a career as an emergency responder with more than 25 years spread between emergency medical services, emergency management, and the fire service. While this experience uniquely positioned me to understand the nuances of the

experiences of emergency responders, it has also come with a bias: I held an archetypical image of these emergency responders. Early in the research process, I recognized that I was somewhat star-struck by some of the participants in this study because of the departments they came from or the positions they held; and in some cases, both. I recalled a specific experience where the words of one participant during an interview left me reeling. After the interview, I reflected on my thoughts and reactions and quickly realized that my expectation for this archetype was actually a bias. From that point, it became clear that I had to view each person as an individual, and not an idealized vision of a firefighter or police officer. I also had to keep myself in check against assuming too much about the commonality of my experiences as an emergency responder and the participants' experiences. So, while I found it easier to empathize with these participants in terms of the responsibilities and pressures of being an emergency responders and having a solid understanding of the job, that was the extent of our common experiences.

In a second example, as a professional instructor and more so as the architect of one of the courses involved in this study, I had to ensure that my biases, pro or con, did not outweigh or overpower the experiences of the participants. For example, I held fast to my belief that as an instructor and training designer, we must build training to be student-centered, not instructor or organization centered. This belief was a foundation of this study and has continued to frame many of the conclusions by defaulting to what is in the best interest of the training participant, not the instructor or organization. As a qualitative researcher, instead of separating myself from my own biases and beliefs (Annells, 2006; Groenewald, 2004; Moustakas, 1994; Ruona, 2005; van Manen, 1990).

I acknowledged them and subsequently used several techniques to keep my biases in check and to ensure the findings reflected the participants' experiences rather than mine.

Finally, as a self-proclaimed techno-geek, I have had many experiences using new and innovative technologies, as well as designing and implementing innovative technologies in training courses. In other words, I consider myself a believer in the value of technology in training. Therefore, a major bias I carried to this study was my desire to reveal *success* with the technology in the training context. Again, I must acknowledge that I was an architect of one of the courses and had some influence over the design of simulation used in this study. In fact, many of the participants in this study knew of my involvement in the course design and the development of the simulation. Because of this, some recognized me as an expert in the use of simulations and / or instructional design. Therefore, I had to take great care to ensure that the conclusions of the study were derived from the lived experiences of the study participants rather than my desires or expectations.

Contradictions

In addition to the impact of my biases, I have had a great deal of reflection on the differences that existed between what the participants said and what they apparently meant. As mentioned in Chapter III, the video recordings provided a unique opportunity to observe contradictions between the words they spoke were and the emotions they felt. For example, at one point, Terrence stated, "I was not scared of it [the technology]…", yet as I reviewed the video, it was clear that Terrence was very uneasy as he recalled the

experience. This was an example of several events that took place throughout the interviews.

The video recordings provided a way to gain a deeper understanding of the experiences of these professionals that only the words from the transcriptions could not provide. As I watched and reflected on the video recordings, I was able to see more and more that opened many avenues to gaining a deeper understanding of the participants' experiences. As I worked through de-conflicting these apparent contradictions, the task led to a greater understanding of the participants in the study and myself. In some cases, the participants were saying things that would allow them to save face, but their body language would betray their words. In the end, this exploration brought greater meaning to their words and led me to the six conclusions mentioned earlier in this chapter. The lesson in this is that the words cannot always be taken at face value to completely understand the meaning.

Recommendations for Practice

Including technology in training provides opportunities for instructors to enhance the training experience and address the aforementioned expectation of "edutainment" (Junginger, 2008, p. 20); however, there must be a clear purpose behind the technology and a solid understanding of how professionals perceive technology in a training context. Too many times, a great idea was generated before its time and discarded after much expense and effort. An unstated intention of my study was to provide practitioners with some insight into the extent to which technology has been accepted in training. While this study is one of several that has examined the issue of technology acceptance, it is

different from most of the existing studies because it examines the issue from a unique context: technology used in training. Consequently, this study offers several useful implications for training practitioners, specifically training managers and instructional designers. In the following section, I discuss these major implications.

Understand That Participants Will Be Anxious About Using the Technology and Address It

For practitioners, it is important to recognize the psychological factors in play with learning and also with the introduction of what may be, in essence, foreign. Instructional designers, instructors, and training managers must all be proactive in anticipating and addressing the anxiety that may arise as a result of using the technology. Several strategies can be employed to mitigate the anxiety. First, instructional designers and training managers need to ensure that courses contain adequate and accurate information on any innovative technology they intend to use in the training. The technology must be well understood before it is used in the training. This means that the training program must be designed in a way that it incorporates meaningful applications of technology. Moreover, activities should be provided early in the training evolution so that the training participants are able to (a) gain experience with the innovative technology and (b) experience the utility of the technology.

Second, because the introduction stage may begin well before the course, pre-course information should include information on the innovative technology used so that potential trainees can develop an initial understanding of the technology before they

arrive in the classroom. This information should clearly describe the innovative technology and explain how it is used.

A change agent that is incapable or unwilling to support the change (i.e., the innovative technology) can do a large amount of harm to the technology acceptance process. Therefore, a third strategy that can be employed is to ensure that the training staff is properly prepared to be opinion leaders and/or change agents. Given the critical role of instructors as authorities in the course and the likelihood that they will be opinion leaders and/or change agents, they should have a firm grasp on how to use the technology and an ability to teach others how to use it. Training managers must ensure that they give adequate initial training on the use of the technology to the instructors. Additionally, training managers must also ensure that instructors are kept up to date as the innovative technology changes.

Let Them Experience the Utility: Provide Meaningful Opportunities for Participants to Interact With the Technology in a Training Context

Training managers, instructional designers, and instructors must take actions to ensure that the course involves activity using the innovative technology in a meaningful way to the trainees, rather than a frivolous activity or lessons in abstraction that do not demonstrate the technology's potential utility.

While it is near certainty that multiple digital personalities are likely to be represented in most training audiences, evidence from this study suggests that this is not a factor in an individual's decision to use technology. Instead, the evidence suggests that factors such as exposure to the specific technology, support from the individual's

social network, and prior experiences with technology in general have a greater impact on a decision to accept technology than a person's digital personality. More importantly, age is nothing more than a coincidence. It is also important to understand that an individual's digital personality is not fixed; it evolves as the factors change. Just as individuals have varied personalities over time, their digital personality may change as their experiences and circumstances change. This study has demonstrated that assumptions about an individual's abilities based on age, socioeconomic status, or perceived digital personality are often inaccurate. Acting upon these assumptions is likely to ultimately increase a trainee's anxiety and risk rejection of the innovative technology.

In addition, trainees' interaction with an innovative technology is important to their acceptance or rejection of the technology. Failing to provide trainees with meaningful opportunities to determine the innovative technology's utility are opportunities lost for acceptance. As noted previously, activities providing these opportunities are critical to informing the trainees' as they are preparing to make a decision about the technology. Therefore, instructional designers must construct and instructors must dutifully carry out activities that allow the innovative technology to be used, preferably in context, so that the utility of the technology can be experienced by trainees. These activities should begin with preparing trainees to use the innovative technology in the training. They should also explain the functionality and provide examples of how the technology would be used in the training.

As the training progresses and the innovative technology is being used to facilitate the training, the instructional staff should coach and mentor trainees as needed. Activities must be designed to ensure that the technology is capable of effectively supporting the activity. For example, an activity should not require a color display if the technology is only capable of displaying black and white on the screen.

Avoid Distractions: Do Not Use Technology for Technology's Sake

Using technology in training to showcase the technology, without ensuring that the technology adds value to the learning is *using technology for technology's sake*. The use of technology simply for the sake of using technology is a death nail resulting in distractions, failures, and ultimately a serious threat to acceptance of the technology. Incorporating innovative technology in training activities must be a thoughtful and carefully planned process. Training managers, instructional designers, and instructors must all take care to ensure that the technology both serves a purpose in the training and enhances the training. If the technology becomes a distraction, the training should be modified to remove the distraction, including removing the use of the technology if necessary. Training professionals must ensure that learning, not the technology, is the central focus of the training.

Recommendations for Research

I adopted a naturalistic, hermeneutic phenomenological research approach in this study adopted. This approach provided the basis to collect rich and descriptive data; however, this methodology does not allow the findings to be generalized to a larger population (Patton, 2002).

More studies are needed to examine the topic from other methodological standpoints. Studies conducted using a grounded theory, ethnographic, and other approaches can deepen our understanding of this phenomenon. For example, a critical perspective on technology acceptance is an important lens that appears to be missing from the current research. Some authors have written on the use of technology from a critical approach (Callahan & Sandlin, 2007; Gabriel, 2008); however, few empirical studies have taken a critical perspective to explore the phenomenon of professionals using technology in a training context from a critical perspective. The critical paradigm will be valuable in that it has the potential to address issues such as the impact of the digital divide, which has been largely overlooked in literature.

Due to time and financial constraints, the study was bounded to a specific set of criteria. First, this study focused on six public safety professionals with varied levels of experience. Future research should include a broader selection of professionals to gain additional insight into this phenomenon. In addition, the public safety professionals in this study were limited to law enforcement and the fire service. These participants were not broadly diverse in terms of their subject matter expertise. Research that examines the experiences of other professionals using innovative technology in a training context would provide additional empirical evidence to enrich the understanding of trainees' experiences as they use innovative technology.

This study focused primarily on highly experienced professionals who were well-established in their field and attending advanced training. So far few, if any, studies have have focused on entry-level trainees. Therefore, I suggest future studies should

focus on entry-level professionals to gain an understanding of their experiences. Other future studies can compare trainees at both levels to identify common and different experiences.

Another limitation of this study was the exclusive focus on innovative or emerging technology. As stated previously, there has been little exploration of this phenomenon of professionals using technology in training contexts. The focus of this study was specifically on professionals' experience as they use *innovative or emerging technology* in a training context; however, there is little research on the experiences of professionals using *any* technology in a training context. As a result, there is little information to allow comparison of experiences with different types of technologies.

In addition, researchers (e.g., Rahim & Finch, 2011; Saeed, Yang, & Sinnappan, 2009; Zuckweiler & Cao, 2009) have shown that individuals with certain learning styles are more receptive to the use of technology in learning environments. Findings from this study did not provide any evidence to support or challenge this belief. Future research should explore the relationship between individuals' learning styles and their experience with innovative technology, including examining if certain learning styles are a determinant of an individual's acceptance of an innovative technology. Findings in this regard would facilitate learner-oriented instructional design.

In this study, I constructed a new conceptual framework based on the experiences of six public safety professionals using innovative technology in a training context. More empirical studies, are needed to test the validity and reliability of this framework. For example, Rogers (2003) diffusion model addressed the concept of discontinuance.

Rogers (2003) defined discontinuance as "a decision to reject an innovation after having previously adopted it" (p. 190). This phenomenon occurs when an innovation is superseded by a different (often newer) innovation or when the user becomes disillusioned with the previously accepted innovation. This phenomenon was not illuminated in this study; however, developing an understanding of this phenomenon will provide a better insight into why individuals reject an innovative technology as well as what to do when this occurs.

Conclusion

The purpose of this research study was to explore the phenomenon of public safety professionals using innovative technology in a public safety training context to better understand their experiences as they used innovative technology in a training context. A single question guided this research: *What is the experience of public safety trainees who are required to use innovative or emerging technology in face-to-face training?*

I employed a qualitative, hermeneutic phenomenological research approach to conduct this study. This approach used in-depth interviews with six public safety professionals with open-ended questions and supporting data from observation and documents to provide a contextual frame. Participants in this study were identified through purposeful sampling focusing on public safety professionals who attended training that incorporated innovative technology conducted in the United States.

Through an analysis of the findings of this study, I have developed six major conclusions that were discussed in this chapter. These conclusions are:

1. An individual's perception of innovative technology in a training context influences his or her decision to accept or reject the technology.
2. Individuals' learning anxiety is intensified when using innovative technology in a training context.
3. Exposure to and early success in using innovative technology are essential to the individual's continued use of it in a training context.
4. Individuals must experience the utility of innovative technology to continue using it in a training context.
5. Role models play a key role in an individual's continued use of innovative technology in a training context.
6. An individual's digital personality does not appear to influence technology use in a training context.

These conclusions provide several contributions to the body of literature concerning this phenomenon. Specifically, two conclusions emphasize the influence of an individual's perceptions and the effect of learning anxiety on an individual's use of innovative technology, which has previously not been addressed in the literature.

Additionally, I have provided implications for human resource development practitioners and researchers. For practitioners, the findings offer valuable information that will potentially enable effective integration of innovative technologies in training. The findings provide opportunities for researchers to explore the impact of different technologies used on trainees' technology acceptance process. Finally, the findings

provide a potential to develop new theories to explain how the acceptance of innovative technology occurs.

In addition to the six conclusions, I presented a new conceptual framework to describe the experiences of professionals using innovative technology in training contexts. These conclusions and the conceptual framework provided unique contributions to scholarship on the topic of technology acceptance. Each of these items moves beyond simply identifying the determinants of technology acceptance and invites an integration of multiple domains into one framework. Finally, this chapter concluded with implications for both practice and additional areas for future research. These implications included considerations for training managers, instructors, and instructional designers.

As stated from the outset of this study, innovative technology is ubiquitous in nearly every society. In this study, I examined the experiences of professionals in a training as they used innovative technology. A significant result of this study was a conceptual framework that described the professionals' experiences of encountering innovative technology. This conceptual framework can provide a foundation for a theory of technology acceptance that will continue to inform training managers and instructional designers on how to best incorporate innovative technology into training courses.

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APPENDIX A

TEXAS A&M UNIVERSITY IRB APPROVAL OF RESEARCH

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TEXAS A&M UNIVERSITY
DIVISION OF RESEARCH - OFFICE OF RESEARCH COMPLIANCE AND BIOSAFETY

1186 TAMU, General Services Complex
College Station, TX 77843-1186
750 Agronomy Road, #3501

979.458.1467
FAX 979.862.3176
http://researchcompliance.tamu.edu

Human Subjects Protection Program — Institutional Review Board

APPROVAL DATE: 12-Jun-2012

MEMORANDUM

TO: EGAN, TOBY

FROM: Office of Research Compliance
Institutional Review Board

SUBJECT: Initial Review

Protocol Number: 2012-0293

Title: Rethinking technology acceptance from a grounded theory perspective

Review Category: Expedited

Approval Period: 12-Jun-2012 **To** 11-Jun-2013

Approval determination was based on the following Code of Federal Regulations:

Eligible for Expedite Approval (45 CFR 46.110): Identification of the subjects or their responses (or the remaining procedures involving identification of subjects or their responses) will NOT reasonably place them at risk of criminal or civil liability or be damaging to the their financial standing, employability, insurability, reputation, or be stigmatizing, unless reasonable and appropriate protections will be implemented so that risks related to invasion of privacy and breach of confidentiality are no greater than minimal.

Criteria for Approval has been met (45 CFR 46.111) - The criteria for approval listed in 45 CFR 46.111 have been met (or if previously met, have not changed).

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(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

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(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation or quality assurance methodologies.

(Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b) (3). This listing refers only to research that is not exempt.)

Provisions:

C:/Users/fpmoats/AppData/Local/Microsoft/Windows/.../620201294958AM35398722913.htm 1/2

Comments:

This research project has been approved. As principal investigator, you assume the following responsibilities

1. **Continuing Review:** The protocol must be renewed each year in order to continue with the research project. A Continuing Review along with required documents must be submitted 45 days before the end of the approval period. Failure to do so may result in processing delays and/or non-renewal.
2. **Completion Report:** Upon completion of the research project (including data analysis and final written papers), a Completion Report must be submitted to the IRB Office.
3. **Adverse Events:** Adverse events must be reported to the IRB Office immediately.
4. **Amendments:** Changes to the protocol must be requested by submitting an Amendment to the IRB Office for review. The Amendment must be approved by the IRB before being implemented.
5. **Informed Consent:** Information must be presented to enable persons to voluntarily decide whether or not to participate in the research project unless otherwise waived as noted above.

This electronic document provides notification of the review results by the Institutional Review Board.

APPENDIX B

OBSERVATIONAL PROTOCOL

OBSERVATIONAL PROTOCOL

A Close Look at Technology Acceptance: A Phenomenological Study

Date:_____

Start time: _____ End time: _____

Location: _____

Setting / individual observed: _____

Observer: _____

Role of the observer (participant / Non-participant):_____

DESCRIPTIVE **REFLECTIVE**

APPENDIX C

INFORMED CONSENT FORM

Participant's Informed Consent for Participation in the Research Study:
A Close Look at Technology Acceptance: A Phenomenological Study

By my signature on this form I acknowledge the following:

1. My participation is voluntary, and I understand that I may choose to respond to any, all or none of the questions asked in the individual interview session(s) or focus group sessions.
2. I was informed that I may withdraw my consent to participate in the study at any time without penalty by advising the researcher.
3. I have been assured that my responses will remain strictly confidential with regard to my identity
4. I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.
5. I understand the research requirement that the individual interview session(s) and focus group sessions are audio-taped and/or videotaped and that no identifying information will be associated with individuals in the study.
6. I understand that I will not receive any direct personal rewards from participating in this study, and my participation will not affect my occupational or student standing.
7. I understand that I will be given opportunity to review the transcribed audio/video taped individual interview and focus group sessions of my comments and input before the transcripts are finalized for analysis.
8. I will have the opportunity of seeing the results of this study if I so request.

Participant signature _____ Date:_____

Printed Name:_____Participant Email Address: _____

Signature of person obtaining consent:_____Date:_____

Printed Name: _____

Principal Investigator: Jason Moats_____ **Phone number of PI:** 979-324-9732

☐ I request a copy of the research results be sent to me at the following address:

_____

_____

Any questions about this research may be directed to the Principal Investigator or Dr. Frederick Nafukho, Department Head, Department of Educational Administration and Human Resource Development at 511DB Harrington Office Building, Texas A&M University, College Station, TX 77840, Phone: (979) 862-3395

Any questions regarding your rights as a research subject may be addressed to the Texas A&M University Human Subjects Research Protection Program (979) 458-4067 All research projects that are carried out by investigators at Texas A&M University are governed by the requirements of the College and state and Federal government.

APPENDIX D

INTERVIEW CONFIRMATION EMAIL

Subject Line: Participation in Research Study

Dear _____,

This email is an invitation for you to participate in a qualitative research study that I am conducting as partial fulfillment of the requirements for obtaining a Doctor of Philosophy degree from Texas A&M University. I would like to provide you with further information about this project and what your involvement would require.

As you are aware, the emerging technology is increasing the capability of training organizations throughout the United States and the world. It is my desire to study the experiences of training participants, such as you, to better understand the decision-making process to accept technology.

Participation in this study is voluntary. It will involve at least one personal interview. Each will session will be video recorded and last approximately 60 minutes. The interview will take place in a mutually agreed upon confidential setting. Should you feel that more time is needed, we can extend the time.

As a participant, you may decline to answer any of the interview questions, should you so desire. You may also decide to withdraw from this study at any time without any negative consequences by advising the researcher. The individual interviews will be video recorded to facilitate collection of information, and later transcribed for analysis.

After each session, I will send you a copy of the transcribed conversations to give you the opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. All of this information is considered strictly confidential, and your name will not appear anywhere in my dissertation or in any written reports from the study. However, with your permission and under a pseudonym, anonymous quotations from the interview and focus groups sessions may be used in the written dissertation or reports.

Following the completion of the study, you may have the results sent to you upon request. All data collected during this study will be retained for a period of three years in a locked file in my office where one but me has access to it. There are no known or anticipated risks to you as a participant in this study.

I would like to assure you that this study has been reviewed, and it has received approval from the Institutional Review Board at Texas A&M University.

Thank you

Jason Moats

APPENDIX E

DEMOGRAPHIC QUESTIONNAIRE

A Close Look at Technology Acceptance: A Phenomenological Study

Instructions: Please provide the following information by filling in the blanks

Please provide your email address _____

What best describes your age ☐ 18-22 ☐ 23-30 ☐ 31-40 ☐ 41-50 ☐ 61-75 ☐ > 75

What is your current profession ☐ Fire Service ☐ Law Enforcement ☐ EMS ☐ Other

If other, please describe _____

How long have you been in your current profession ☐ <1 yr ☐ 1-5 yrs ☐ 6-10 yrs ☐ 11-15 yrs ☐ 16-25 yrs ☐ > 25 yrs

How long have you used a tablet (e.g. iPad, Kindle Fire, Motorola Xoom, Nook Color, etc) ☐ Never ☐ < 3 mos ☐ 3-11 mos ☐ 12-24 mos ☐ > 24 mos

How long have you used a SMART Phone (e.g. iPhone, Droid, etc) ☐ Never ☐ <3 mos ☐ 3-11 mos ☐ 12-24 mos ☐ > 24 mos

How often do you currently use a personal computer for personal or business use? ☐ Never ☐ Daily ☐ 3-4 / wk ☐ 1-2 / wk ☐ <1/wk

How long have you played console video games (e.g. X-Box, Wii, Nintendo, etc) ☐ <6 mos ☐ 6-24 mos ☐ 25-48 mos ☐ > 48 mos

How many different training courses have you taken online ☐ 0 ☐ 1-2 ☐ 3-5 ☐ >5

APPENDIX F

INTERVIEW PROTOCOL

Interview Protocol

A Close Look at Technology Acceptance: A Phenomenological Study

Date:_____

Start time: _____ End time: _____

Location: _____

Interviewer: _____

Interviewee: _____

Role of the Interviewee: _____

1. Please share your experience when you encountered a new or unfamiliar technology used to facilitate a training course?

2. What were your feelings toward the technology as you were learning to use it?

3. How did you feel about your performance in the training as you were learning and using the technology?

4. Reflecting on the use of the technology, what kind of reaction did you have after initially using it?

5. In what ways has this experience of using technology impacted your experience to using technology in other settings?

6. Based on your experience, what would you want someone to know as they integrate new and/or unfamiliar technology in training?

APPENDIX G

DATA ANALYSIS SAMPLE SHEETS

A CLOSER LOOK AT TECHNOLOGY ACCEPTANCE: A PHENOMENOLOGICAL STUDY

COMBINED INTERVIEWS

1.1	Terrence	Q6d	62	I would lean towards the value as opposed to – 'cause they haven't really learned it real well. They've learned it at a surface level. I think they see the value and when I add a little bit to what we were talking about that can I use it outside of here, yes, they can't take the electronics with 'em but more teach them as the paper side of it that even though they may not have the computers there, we still show 'em – we've taken what is a paper hard document and put it into an electronic form. So we haven't completely taken away the abilities to use it outside of this environment. So I think that's a good point that even though you can't walk away with our software, everything that we do you can use in a hard copy and it's still – so I think that's a lot of why they really like it better. They can validate it outside of the classroom. The processes, yeah, just the psychological – the things they've learned they can take those processes and put them into action and even the forms, like the 213RRs that we have put into an electronic format are available to 'em to physically write on and utilize all the things that we utilize in the simulation are available to them. The knowledge, the process knowledge is valid outside the room. The electronic forms that we put into the simulation are valid outside of the classroom and useable, and also the simulation themselves are written and you'll see a lot of that in the students' feedback that the simulations were good and that they could actually say this is something we may encounter. And that, again, makes it something they can use outside of the classroom. If they thought that this was a simulation it really is not valid or it only happened here, then you're losing a lot of the instructional and learning value of it. But if they think got it you know that's – that can happen all right and it has happened now that it's a takeaway for 'em.	This is also a recurring theme – it's the process that we teach that is of value… DUP
1.2	Everette	Q1	3	But to be quite honest I was skeptical whether any laboratory setting could capture the sense of urgency that's necessary to build that skill set to effectively manage a crisis. So that was kind of my first exposure to the technology that created the simulation which in effect created the urgency that I speak of.	He was skeptical about whether a laboratory setting could build the skill set
1.2	Everette	Q2	13	Like I say, initially there's – I felt very vulnerable in trusting the machine or even deviating from my tried and true process that I've established over years and years responding to thousands of incidents. And now suddenly to deviate from that process and utilize the technology, utilize the machine, resulted in that initial apprehension. .	He continues to discuss his apprehension from 9, but it is not only lack of exposure, but a resistance due to the requirement to rely on the technology for something he had done without it. DUP

1.3	Bobby	Q5	45	Now, if you don't mind, I'll give you another anecdotal — example that new technology doesn't necessarily work everybody. There is in our reserve unit a officer, who is 67 years old. He was a full-time sheriff before becoming a reserver. And before that, he was a A&M police officer, UPD. I'm not sure what he did at UPD. At the Sheriff's Office, he was our crime prevention officer. And I'm not sure what he did there either. I mean, I know what a crime prevention officer does, but I'm not sure what he did. He is a very pedonic person. If anything can be said in twice as many words, he can find a way to do it and doesn't hesitate to tell you in great, great, great detail of each and every step of what he may have done or what he plans to do or so forth. And that is, I mean, well, when I leave here, I guess I'll go out to the car and then I'll start it up and then I'll look both ways and back out. And then, I will try to find my way back to the exit gate that's across the bridge, so – of course, I know to go – since there's two bridges, I'll go to the right, because it's obviously a two-way traffic there and one-way. Usually, the rule is you keep to right at least in the United States and North America. Some places in Europe, it's drive on the left, you know?	Set up of the story of his friend / colleague
1.3	Bobby	Q5	57	So that is part of any new technology is to make it also user-friendly. Both BMW and Mercedes Benz have been severely criticized for their console controls on their latest cars as being just so complex that you can't drive and operate it at the same time. Everything is, you know, submenu, submenu or a different button, press, press, two seconds for one thing or one second for one thing. And it just requires too much knowledge of how to operate it. Even if you can do so with one finger while you drive, it's still too complicated to –	Bobby is discussing his preference about technology – It must be user friendly!
1.3	Bobby	Q6	70	That may be true of non-technology too, but with technology there's always so many more different elements, of possible variations that it can start making it complex instead of simple.	
1.3	Everette	Q3	18b	And then that – the subsequent explanations that I needed in demonstrations, ultimately I think helped me learn it better because I – it forced me to be a little more analytical and really pay attention versus some of the other people that were just flying through it I think missed some of the instruction because they were steps ahead of the instruction.	
1.3	Everette	Q4	20	I would say like the first night it still was a little overwhelming to me because in my mind I'm still comparing the use of this new technology and these new maneuvers and these new processes. I'm still comparing that against my tried and true technology-less methods and that comfort zone that you have with some method or process that you've utilized for years and years. So – and I don't know if it was my – just that still reluctance to totally embrace it – is due to the fact that it was just a new process or that it was a new process that was from a technology-base that I really wasn't familiar with. But there still was a little bit of reluctance to fully embrace it. It wasn't until things were demonstrated numerous times and I actually was able to practice it and see the fruits that I became an absolute convert to the potential of technology and training and incident management.	As he was able to use the technology and apply it to the situation, he was able to understand its use better.
1.3	Everette	Q5	23b	and even now I still see huge reluctance amongst the LAFD membership when that initial confusing phase of a new technology tool is introduced.	

COMBINED INTERVIEWS

1.3	Juan	Q1	3	Well, as you know, I attended the very first class, first EIMUC course that was taught here, and at first, my very first day here, I said, "Man, what did I get into?" Because, I mean, I went all the electro… all the technology, cause we were accustomed, I was always accustomed to doing lots of hands-on training.	He is discussing his initial response as he started the training. In the interview this was portrayed with some clear apprehension DUP
1.3	Juan	Q1	9	Well, again, that very first day was kind of way over my head. The second day I was able to understand a whole lot more and have the opportunity to use it more.	The increased exposure to the technology, the more comfortable he was with it.
1.3	Juan	Q3	19	The emotions were, well, I was just a little leery that I wouldn't be able to pick it up fast enough to stay in the loop with the rest of the class. But, again, I had the opportunity to use it enough where I overcame that learning problem. The very first day was, I was really lost. And luckily, the instructors were around to provide guidance for us. And all the reference literature was available.– Again, the system, itself, the computer system, once I understood it better, I was able to, you know, become proficient in it. The – I don't know what else to say on that	Juan is discussing his initial reaction, but reinforces that he was able to become more comfortable with using the system more and more Exposure eased apprehension
1.3	Terrence	Q1	6	Initially, walking in I – let me just think back from – I had had just a vision of it. I had a little background to it but into as a student coming in, initially you're I wouldn't say overwhelmed is the right but you're apprehensive about what all am I gonna need to know, how interactive am I gonna be on a personal level with this and how quickly can I assimilate the technology and make it useable through the class not knowing if I'm behind with other students who may be more familiar or whatever but so as a,– as the first scenarios were being started, again, you get that apprehension about am I doing this right, am I going to the right pages, am I doing.	Talks about his apprehension – Staying up with other students First impression before touching the technology Like Juan and Everette, exposure leads to comfort DUP
1.3	Terrence	Q2	12	Again, the apprehension was it is gonna be so complicated that it's gonna be adversely affect my learning experience and I found that wasn't the case.	Experience with technology lessens the apprehension
1.3	Terrence	Q2	17	You know I wasn't scared of it. I wasn't – didn't feel like I would be overwhelmed by it. It just kind of to me felt like a new learning environment and a little apprehensive about how does this all play out.	

APPENDIX H

VITAE

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EDUCATION

PhD — Educational Human Resource Development, ABD
Anticipated graduation December 2013
Texas A&M University, College Station, TX

M.S. — Educational Human Resource Development, May 2007
Texas A&M University, College Station, TX

B.S. — Workforce Education and Development, May, 1997
Specialization in Education and Training Development
Southern Illinois University – Carbondale, Carbondale, IL

A.S. — General Studies, December 1996
Vincennes University, Vincennes, IN

MAJOR RESEARCH AREAS AND INTERESTS

Understanding the integration of emerging and innovative technology in training to improve performance; understanding factors that improve performance in organizational training interventions (learning transfer and knowledge retention); identifying and exploring the role of human resource development in homeland security; exploring the role of human resource development in crisis management;.

INDUSTRY EXPERIENCE

Program Director, Emergency Services Training Institute, Texas A&M Engineering Extension Service, Texas A&M University System, 6/1/2012 –Present

Training Director, Emergency Services Training Institute, Texas Engineering Extension Service, Texas A&M University System, 1/1/2012 – 5/31/2012

Training Manager, Emergency Services Training Institute, Texas Engineering Extension Service, Texas A&M University System, 10/1/2007 – 12/31/2011

Program Coordinator, Emergency Services Training Institute, Texas Engineering Extension Service, Texas A&M University System, 5/1/2007 – 9/30/2007

Training Coordinator, Emergency Services Training Institute, Texas Engineering Extension Service, Texas A&M University System, 10/1/2004 – 4/31/2007

Instructor, Emergency Services Training Institute, Texas Engineering Extension Service, Texas A&M University System, 2/1/2002 – 9/30/2004

Hazardous Materials Training Program Coordinator, Kentucky Division of Emergency Management, Commonwealth of Kentucky, 5/1/2000 – 1/31/2002

UNIVERSITY TEACHING

Instructor, Adelphi University, Garden City, NJ
University College

- UEM 308 – Emergency Services Leadership (Spring 2013)
- UEM 306 – Master Planning for Public Emergency Management (Fall 2012)

Co-Instructor, Texas A&M University, College Station, TX
The Dwight Look College of Engineering
Safety Engineering Program
Course Instruction: (with Jason Loyd)

- SENG 422/677 – Fire Protection Engineering (Fall 2012; Fall 2013)

Instructor, Texas A&M University, College Station, TX
The Bush School of Government and Public Service
Certificate in Homeland Security
Course Instruction:

- INTA 689 – Foundational Readings in National Preparedness (Spring 2009)
- PPSA 689 - Foundational Readings in National Preparedness (Spring 2010)

Co-Instructor, Texas A&M University, College Station TX, 2008
Educational Administration Program
Department of Education Administration and Human Resource Development, College of Education and Human Development

Course Instruction (With Dr. Fred Bonner):

- EDAD 601: College Teaching

JUNIOR/COMMUNITY COLLEGE TEACHING

Guest Instructor, 1986-1991

- Vincennes University – Jasper Center, Jasper, IN, Emergency Medical Technician
- Vincennes University, Vincennes, IN, Emergency Medical Technician

REFEREED PUBLICATIONS

Moats, J. & McLean, G.N. (2009). Speaking our language: The Essential Role of Scholar-Practitioners in HRD. *Advances in Developing Human Resources.* 11(*4*), 507-522.

Moats, J., Chermack, T.J., & Dooley, LM. (2008). Using scenarios to develop crisis managers: Applications of scenario planning and scenario-based training. *Advances in Developing Human Resources.* 10(*3*), 397-424.

REFEREED CONFERENCE PROCEEDINGS

Moats, J. (2009). *Human Resource Development and Homeland Security: HRD's role in securing the homeland.* Presentation presented at the AHRD 2009 International Research Conference, Arlington, VA.

Rolle, A., Kenzhegaranova, M., Fowler, R., Reid, G., & **Moats, J.** (2008). *Five reflections on the 2007 AHRD International Research Conference.* Paper presented at the AHRD 2008 International Research Conference, Panama City, FL.

INVITED PRESENTATIONS AND PAPERS

McWhorter, R., **Moats, J.**, and Mancuso, D. (2009). Research workshop on national security human resource development. Invited presentation for the Project on National Security Reform and George Washington University, Alexandria, VA.

Plourde, K. & **Moats, J** (2007)**.** The incident command system: A process to move our response stance from reactive to proactive. The Coast Guard Proceedings of the Marine Safety and Security Council. 63(*4*), 11-14.

Moats, J. (2002). Learning lessons: After action reports. Firehouse.com (online publication. http://cms.firehouse.com/web/online/Training/Learning-Lessons--After-Action-Reports/40$98).

CONFERENCE PRESENTATIONS

Rolle, A., Kenzhegaranova, M., Fowler, R., Reid, G., & **Moats, J.** (2008). *Five reflections on the 2007 AHRD International Research Conference.* Paper presented at the AHRD 2008 International Research Conference, Panama City, FL.

Moats, J. (2010). *Case Studies: Tools to Learn By*. Presentation presented at the 2010 International Association of Emergency Managers Annual Conference, San Antonio, TX.

Moats, J. (2009). *Reaching Beyond the Classroom: Using Virtual Worlds to Conduct Training.* Presentation presented at the 2009 International Association of Emergency Managers Annual Conference, Orlando, FL.

Moats, J. (2004). *Terrorism in the Barnyard.* Presentation presented at the 2004 Kentucky Emergency Services Conference, Lexington, KY.

Moats, J. (2004). *National Incident Management System.* Presentation presented at the 2004 Kentucky Emergency Services Conference, Lexington, KY.

Moats, J. (2004). *Lessons Learned from Major Incidents.* Presentation presented at the 2004 Kentucky Emergency Services Conference, Lexington, KY.

Moats, J. (2004). *Terrorism in the Barnyard.* Presentation presented at the 2004 Fire Department Instructor's Conference, Indianapolis, IN.

Moats, J. (2003). *Terrorism in the Barnyard.* Presentation presented at the 2003 Fire Department Instructor's Conference, Indianapolis, IN.

REVIEWER

Conferences:

Academy of Human Resource Development (AHRD) International Research Conference, 2007-present.

Journals:

Journal of European Industrial Training, September 2008 - present

BOOKS

Moats, J. B., (2007). Agroterrorism: A guide for emergency responders, Texas A&M University Press, College Station, TX

COURSES DEVELOPED

Sports and Special Events Incident Management	TEEX	Course Manager/SME
Managing Critical Incidents for Higher Education Institutions: A Multi-disciplinary, Community Approach	TEEX	Development Manager/SME
Incident Command Systems Forms Review	TEEX	Course Manager/SME
Advanced Incident Management / Unified Command	TEEX	Course Manager/SME
INTA 689 – Foundational Readings in National Preparedness	TAMU	Co-author/SME
Intermediate Concepts of Incident Command	TEEX	Lead Author/Lead SME
Advanced Concepts of Incident Command	TEEX	Lead Author/Lead SME
WMD Enhanced – IM/UC	TEEX	Lead Author/Lead SME
WMD Incident Management Unified Command	TEEX	(rewrite) Contributing author
WMD Incident Management Concepts	TEEX	Contributing author
WMD Awareness Internet Course WMD 0005	TEEX	Lead author/Lead SME
WMD Defensive Operations	TEEX	Lead author/Lead SME
Hazardous Materials Awareness	University of Louisville	Author/Designer
KYERC Incident Management System	Commonwealth of Kentucky	Author
KYERC Hazardous Materials Awareness	Commonwealth of Kentucky	Author
KYERC Hazardous Materials Operations	Commonwealth of Kentucky	Author

PROFESSIONAL SERVICE

Chair, Scholar-Practitioner Special Interest Group (SIG), Academy of Human Resource Development, 2011-2013

Fellow, Integrated Center for Homeland Security, Texas A&M University, 2008-2009

Member, U.S. Department of Homeland Security Target Capabilities Working Group (Emergency Operations Center), 2008-2010

Member, U.S. Department of Homeland Security Target Capabilities Working Group (Onsite Incident Management), 2007-2010

PROFESSIONAL AFFILIATIONS

- Academy of Human Resource Development
- American Evaluation Association
- American Society for Training and Development
- Project Management Institute

AWARDS, HONORS, CERTIFICATIONS

Certificate in College Teaching, Texas A&M University, 2009

Certificate in Homeland Security, Texas A&M University, 2008

Certified Training and Development Professional, Texas A&M University, 2008

Certified Instructor, National Domestic Preparedness Consortium, 2003

Certified Technical Trainer, Comp TIA, 2002

Certified Hazardous Materials Manager - Master, International Association of Certified Hazardous Materials Managers, 2002-2008

Honorable Discharge, United States Navy, 1996

Navy and Marine Corps Achievement Medal, United States Navy, 1996

Valor Award, Escambia County (FL) Firefighters Association, 1993

Award of Valor, Warrington (FL) Fire Department, 1993