6-13-2018

Investigating eLearning Continuance Through Expectation Disconfirmation Theory

Susana Reyes Lee
Louisiana State University and Agricultural and Mechanical College

INVESTIGATING ELEARNING CONTINUANCE THROUGH EXPECTATION DISCONFIRMATION THEORY

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Leadership &
Human Resource
Development

by
Susana Reyes Lee
B.S., Louisiana State University, 1996
M.S., Louisiana State University, 2000
August 2018

Esto se dedica a toda mi familia que hizo esto posible.

Por ustedes, Mami y Papi, lo logre!

Mis hermanos: R. Johana Zeno, Ramon Reyes, Jerry Reyes

Mis hijos: Miles, Xana, y Cruz

My biggest supporter: William Boyd Lee, II

Con Dios y Por Dios. Amen.

ACKNOWLEDGEMENTS

Even through the challenges, I have learned to appreciate this journey. My sincerest thanks to my final committee members. To my advisor, Dr. Tracey Rizzuto, I appreciate your guidance, support, understanding, and confidence. Thank you to Dr. Petra Robinson, Dr. Sunyoung Park, and Dr. Malcolm Richardson for being outstanding in providing such well-needed and specific guidance and support. My initial road in this program started by taking an undergraduate course with Dr. Elwood "Ed" Holton. I have also had the pleasure of being encouraged and mentored in this journey by Dr. Michael Burnett, Dr. Krisanna Machtmes, Dr. Joe Kotrlik, Dr. Earl Johnson, and Dr. Reid Bates.

My research would not have been a reality without assistance from several others. A special thanks to Louisiana State University (LSU) for allowing me to use data from a sponsored program. I am especially appreciative of the support I received from each of my employers through this journey. They, like my committee, believed my work was important. Thank you Tom Tucker, Lee Ann Murphey, Germaine Tarver, Rochelle Barnette, Victoria Hess, and Kelly Papania. Thank you to the most recent work family of motivators which includes Jessica Louque, Thomas Rudd, Zachary Stephens, Rick Williams, Krugerrand Hollins, and Daniel Adkins. To all of the special parents, friends, colleagues, and acquaintances that assisted with my kids and my husband when you knew that we needed it. Thank you to Dr. Kimberley Williams and Anne Roberts who stepped in at the end to give me the extra boost that was needed.

A huge thanks to my ultimate academic support net. Dr. Regina Leingang, Dr. Missy Korduner, and Dr. Vicky Katsioloudes, your words, support, friendship, and love have been, and will continue to be, more than appreciated.

My family deserves a great acknowledgement. Thank you Mami, Papi, Ramon, Yokasta, Jerry, Chunee, Johana, Micah, Alysia, Carlos, Patricia, and William. Although my father-in-law did not get to see me finish this journey here, I know that he is smiling big on this one and saying 'Finally!'. Thank you, brother-in-law, for setting the path and providing much needed encouragement. Thank you, my sister, for knowing when to push and when to pull. I appreciate you more than you will ever know. You made sure that we kept going. Thank you to my kids who, over these last few years, have been understanding with their mother for not being everywhere or being able to do everything that they wanted. Hope that I have taught you something, but my biggest hope is that I have made you proud. The hugest acknowledgement goes out to my husband, William Boyd Lee, II. From the day I announced that we were accepted to LSU (again), you supported, you cooked, you cleaned, you drove, you did it all. We have done it! Now to see what's next!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ACB	Actual Continuance Behavior
AMOS	Analysis of a Moment Structures
ANOVA	Analysis of Variance
CB	Continuance Behavior
CBC	Continuance Behavior Compared
CI	Continuance Intention
CLF	Common Latent Factor
CMV	Common Method Variance
CPD	Continuing Professional Development
CPE	Continuing Professional Education
CVI	Content Validity Index
D&M ISS	DeLone and McLean Information Systems Success
DHS	Department of Homeland Security
DSC	Disconfirmation
ECM	Expectation Confirmation Model
ECT	Expectation Confirmation Theory
EDT	Expectation Disconfirmation Theory
eLSS	elearning Satisfaction and Success Survey
EMOT	Extrinsic Motivation
FEMA	Federal Emergency Management Agency
GS	General Satisfaction
HRD	Human Resource Development

I-CVI	Item-Level Content Validity Index
IMOT	Intrinsic Motivation
IQE	Information Quality Expectation
IQP	Information Quality Perception
IS	Information Systems
IT	Information Technology
LMS	Learning Management System
LQE	Learning Quality Expectation
LQP	Learning Quality Perception
LSU	Louisiana State University
MOT	Motivation
MV	Marker Variable
NOSQ	Neutral Objects Satisfaction Questionnaire
NTED	National Training and Education Division
SAT	Satisfaction
SDT	Self-Determination Theory
SME	Subject Matter Expert
SPSS	Statistical Package for the Social Sciences
SyQE	System Quality Expectation
SyQP	System Quality Perception
SrQE	Service Quality Expectation
SrQP	Service Quality Perception
TAM	Technology Acceptance Model

TPM	Theory of Planned Behavior

NOMENCLATURE

Acceptance—the initial use of eLearning (Chiu et al., 2005)

Andragogy—"the art and science of helping adults learn" (Knowles, 1980, p.43)

Asynchronous—not existing or happening at the same time; when learning happens online but is not happening at the same place or same time within a group of learners (edglossary.org, n.d.)

Confirmation—positive disconfirmation; performance is better than expected

Continuance (completion, persistence, actual use; courses completed)—use behavior; self-reported use (Petter & McLean, 2009)

Continuance intention—stated likelihood to engage in a behavior (Oliver, 2014); intention to continue to use or courses intended to complete

Continuing professional development (CPD) (also continuing professional education, professional learning, or staff development)—an area of adult and continuing education that concerns professional groups and their ongoing learning and development (Coady, 2015; Jeris, 2010); means by which professions across the world ensure that their knowledge and skills remain up-to-date and relevant to changing needs and environments; a significant contributor to the quality and reputation of professions as well as the quality of national and international social life and economic wellbeing (Friedman, 2012); a field of practice and study focused on the ongoing learning needs of professionals (Cervero, 2001)

CPD eLearning – the use of eLearning to deliver Continuing Professional Development (CPD)

Disconfirmation—when discrepancies occur (being better or worse than expected) between prior expectations and actual performance or observation (Churchill & Suprenant, 1982; Oliver, 2014)

eLearning (electronic delivery of learning; also e-learning, online learning, or web-based training)—the education and instruction of learners with the aid of technology (Clark & Mayer, 2003; Moore, Dickson-Deane, & Galyen, 2011; Phillips et al., 2011); the provision of content through technology and using pictures, words, and video to help learners reach learning objectives thereby improving their employing organizations (Clark & Mayer, 2003)

Emergency response—actions taken by emergency responders to react to a disaster

Emergency responders—those responsible for the protection and preservation of life, property, evidence, and the environment. Emergency responders can include anyone in the following categories: fire service, law enforcement, emergency medical services (EMS), hazardous materials response, public safety communications, public health, healthcare, emergency management agency, public works, and governmental administrative personnel (Who Do We Serve?, 2016)

Expectation—predicted or anticipated performance (Churchill & Suprenant, 1982; Oliver, 2014)

Expectation Disconfirmation Theory (EDT) (also known as Expectation Confirmation Theory, Expectancy Disconfirmation Theory, and Expectancy Confirmation Theory)—a theory that seeks to explain post-purchase or post-adoption satisfaction as a function of pre-usage expectations, post-usage perceived performance, and disconfirmation of beliefs

First responders—those emergency responders, usually the first to arrive, who are responsible for going immediately to the scene of an accident, disaster, or emergency to provide

assistance; usually includes emergency management, emergency medical services, fire service, governmental administrative, hazardous materials personnel, healthcare, law enforcement, public health, public safety communications, and public works (NTED, n.d.)

Human resource development (HRD)—"a process for developing and unleashing human expertise for the purpose of improving performance" (Swanson & Holton, 2009, p. 99); "The field of study and practice responsible for fostering long-term, work-related learning capacity at the individual, group, and organizational level of organizations" (Watkins, 1989, p.427)

Information quality—the characteristics of the eLearning output such as accuracy, timeliness, and completeness (DeLone & McLean, 1992, 2003; Petter & McLean, 2009)

Intrinsic motivation—the natural tendency for a person to want to learn and be a part of something (Davis, Bagozzi, & Warshaw, 1992; Venkatesh, 1999; Yoo, Han, & Huang, 2012)

Law enforcement—individuals who work, on a full-time, part-time, or voluntary basis, for agencies at the local, municipal, and state levels with responsibilities as sworn law enforcement officers (NTED Catalog, n.d.).

Learning—the process by which people gain knowledge, sensitiveness, or mastery of skills through experience or study (Houle, 1980)

Learning management system (LMS)—complex, purpose-built, enterprise-wide software applications that deliver courses and track learner activity (Klein & Ware, 2003)

Learning quality—the combination or aggregate of information quality, system quality, and service quality

Lifelong learning (learners)—continuation during a person's lifetime of planned, directed processes for adding and incorporating active learning to an individual's values, assumptions, competencies, habits, expectations, motivators, concerns, thought patterns, learning style, attitudes, worldview, and other behaviors (Hoberman, Mailick, & Ebert, 1994)

Motivation—the natural capacity to direct energy in the pursuit of a goal; components related to expectancy and importance (Wlodkowski, 1997)

Perception (of performance)—what users believe about the rendered service or delivered product (Chou, Lin, Woung, & Tsai, 2012)

Professional development—the enhancement of thought, information processing, problem solving, decision making, and reasoning and judgment skills and the ability to attain expertise by taking a more intuitive approach to the topic (Daley, 2000)

Quality—judgement or performance excellence (Oliver, 2014)

Satisfaction—when users or consumers are pleasurably fulfilled after comparing performance to their expectations (Oliver, 2014); the approval or likeability of CPD eLearning and its output (Petter & McLean, 2009)

Service quality—support of the learners, often measured by responsiveness, reliability, and empathy of the support organization (Petter & McLean, 2009)

System quality—technical performance of the eLearning system in terms of reliability, convenience, ease of use, functionality, and other system metrics (DeLone & McLean, 1992, 2003; Petter & McLean, 2009)

Workforce development—"systemic coordination between public and private work programs, policies, and contexts" (Roth, 2004, p. 10)

ABSTRACT

This study set out to investigate the Continuing Professional Development (CPD) eLearning participation and completion phenomenon of learners and to explore motivation of CPD eLearning intentions and completions. This study focused on why learners choose CPD eLearning and why they continue in CPD eLearning. Based on the Expectations Disconfirmation theory (EDT) and the DeLone and McLean Information Systems Success Model (1992), a survey was developed and then sent to a cross-section of registered CPD eLearners from the first responder community. After the data was collected 217 responses were analyzed with SPSS correlational techniques and through PROCESS which is a modeling tool. The study found that overall information, service, system, and learning expectations and perceptions of quality are positively related to each other as well as disconfirmation and satisfaction. Furthermore, disconfirmation was found to be positively correlated to satisfaction. Continuance intention and continuance behavior were positively related to each other as well as to satisfaction, respectively. Intrinsic motivation did have a moderation effect on satisfaction as it related to continuance intention and continuance behavior. Although generalization of the results should be exercised with caution, this study offers implications to CPD eLearning research and theory building with relation to disconfirmation, satisfaction, motivation, continuance intention, and continuance behavior. Many variables, ultimately, positively affect CPD eLearning continuance. Learners that are more satisfied tend to continue in CPD eLearning, but also have the motivation to continue in other types of eLearning. CPD eLearning quality and the learner's motivation should not be forgotten if learner continuance is the goal. Continuance behavior is related to the learner's satisfaction. All parties involved in the development and delivery of the CPD eLearning should be mindful. The study fills a gap in the CPD eLearning literature. This study had a mix of

first responders that had and had not completed the CPD eLearning. This provides a different perspective than most studies tend to gather.

CHAPTER 1. INTRODUCTION

1.1 Background and Rationale

Globally, millions of adults engage in professional development opportunities using technology (Friedman, 2012; Ambient Insight Research, 2015; Horrigan, 2016; Ross, Barr, & Stevens, 2013). As technology evolves, so does its hosting capacities for serving the educational and learning needs of adults seeking to hone their knowledge and skill development (Sleezer, Conti, & Nolan, 2004). The demand for technology-based workplace learning and training presents an interesting and complex dynamic worth exploring (Bierema & Eraut, 2004; Horrigan, 2016). Only 10 years ago, online learning was still an emerging trend in higher education and the workplace (Chen, Lin, & Kinshuk, 2008; Kidd, 2010). But today, according to a 2016 Pew Research Center report, 36% of all adults are professionals who have taken training to improve their job skills, advance their careers, or obtain a license or certification (Horrigan, 2016). This report also found that 55% of those professionals completed their learning on the internet. The education and instruction of learners with the aid of technology, also known as eLearning (Clark & Mayer, 2003; Moore, Dickson-Deane, & Galyen, 2011; Phillips, McNaught, & Kennedy, 2011), continues to influence research in the human resource development (HRD) and adult learning fields after many years (Mansvelt, Suddaby, O'Hara, & Gilbert, 2009; Park & Choi, 2009).

While continuing professional development (CPD) has been widely studied (Houle, 1980; Coady, 2015), more research is needed to better understand the factors related to its continued use through the mechanisms of eLearning. CPD is the field of practice and study that includes formal, nonformal, and informal approaches to the continual learning and development of professionals (Eraut, 1994; Jeris, 2010). CPD offered via eLearning (CPD eLearning) is often

employed to deliver training (ASTD, 2012; Russ-Eft, Watkins, Marsick, Jacobs, & McLean, 2014) to reach learners and workforces that are spread out geographically and to train emergent skill demands quickly and in real time (ASTD, 2013; Russ-Eft et al., 2014). Although the majority of adults tend to learn in an elective manner, much of the research has focused on employer-mandated eLearning (Eraut, 2004; Merriam, Caffarella, & Baumgartner, 2007; Tough, 1978). In andragogy, which is defined as "the art and science of helping adults learn," adult learners are characterized as more self-directed and independent (Knowles, 1980; Knowles, Holton, & Swanson, 2005). Both employees and the organization depend on nonformal, informal, and formal learning opportunities as they relate to employee tasks, knowledge, and products (Baskett & Marsick, 1992; Li, Brake, Champion, Fuller, Gabel, & Hatcher-Busch, 2009; Merriam, Caffarella, & Baumgartner, 2007).

As the need for professional skill and knowledge grows, many public and private organizations seek opportunities to meet the continuing education demands so they can strive for continuous quality improvement and greater public accountability (Bierema & Eraut, 2004; Coady, 2015). Thoughts about CPD might immediately call to mind teachers who find themselves in a constantly changing field where they need to stay current on instructional methods and best practices (Cranton, 2016; Myers, 2013). Healthcare professionals may also come to mind since they must stay abreast of new symptoms, treatments, and technologies (Joyce & Cowman, 2007; Liang & Wu, 2010; Ross et al., 2013). First responders should come to mind as well. For first responders, successful, high-quality CPD eLearning is a matter of life or death because their services depend heavily on the proper use of high-level skills (Collin, Van der Heijden, & Lewis, 2012; Dirkx, Gilley, & Gilley, 2004). Emergency medical technicians (EMTs), as first responders, are now expected to have more than a certification in basic

emergency services; now they must be able to conduct an effective tactical response to prevent or mitigate a terrorist incident involving a radiological, biological, or chemical agent. Better performance in both the assessment of and response to these situations leads to improved accountability results for the public. Although many professions participate in CPD eLearning, much of the literature and research reports that the areas of medicine, nursing, and first response are increasingly using this mode of training (Friedman, 2012; Wetta-Hall et al., 2006). In addition, there are many other non-medical first responders, such as law enforcement and fire service, who also rely heavily on CPD eLearning to ensure quality performance. The uptake of CPD eLearning among these occupational groups is only likely to increase. Therefore, understanding how to improve CPD eLearning among these occupational groups is an important issue for investigation (Friedman, 2012).

CPD eLearning empirical research stands to make a great impact and add value to the literature by understanding how to improve the degree to which eLearners successfully complete CPD eLearning (Phillips et al., 2011; Russ-Eft et al., 2014), particularly among first responders who depend upon it so greatly (Coady, 2015). Additionally, research into improved participation in and completion of CPD eLearning is of great importance to the field of HRD since it is tasked with ensuring that organizations properly prepare and develop people. While some organizations provide excellent opportunities for CPD eLearning, many adults, particularly first responders, rely on career self-management to enhance their knowledge, skills, and performance in their current role. Research that accounts for the unique career self-management challenges of first responders (as opposed to traditional students in higher education degree programs where a significant portion of the eLearning literature is situated) is needed to establish the proper

method, support structures, and tools that can support CPD completion and success for first responder occupations.

Cherrstrom, Robbins, & Bixby (2017) conducted a systematic analysis in the *Adult Learning* journal based on adult and continuing education topics covered from 2006 to 2015. Training- and professional development-focused articles represented 7.6% of the articles in the journal's publications during the study's time period. Teaching, learning, and curriculum were at the top with about 26.2%, literacy was at 13.1%, and international was at 11%. Conceptual research design was the most widely used at 72.4% with empirical at 27.6%. This study also highlighted the need for more research in non-academic field settings. For these reasons, this study investigated the user experience and completions of CPD eLearning among first responders.

1.2 Why Study First Responders?

Many studies describe incidents surrounding the September 11, 2001 (9/11), events as so disastrous and massive that it is no wonder that they served as a catalyst to research and changes within many professions, communities, and organizations (Pattillo, 2003). Those catastrophic events stimulated the creation of the Department of Homeland Security (Homeland Security Act of 2002, 2002) with its initial mission of preventing terrorist attacks, reducing vulnerability, and minimizing damage while assisting with recovery. For many, the events of 9/11 would also serve as a learning stimulus that motivated learning and training by individuals and organizations (London & Sessa, 2007). Additional and more recent successful terrorist acts such as the Boston Marathon bombings continue to call attention to the national importance of proper preparation and training in counterterrorism (Dodds, 2013; Shane, 2013). Researchers are interested in learning more about steps taken to improve the state of preparedness, response, and training in

communities where devastating, terror-related events have already challenged first responders (Bailey & Cree, 2011; Wetta-Hall, Fredrickson, Ablah, Cook, & Molgaard, 2006).

Although the Global Terrorism Database has found an overall decline in terrorist attacks over the last three decades (National Consortium for the Study of Terrorism and Responses to Terrorism [START], 2012; Shane, 2013), researchers believe that thwarted attempts of terrorism (Carafano, Bucci, & Zuckerman, 2012; Dahl, 2011) further support the necessity for disaster and counterterrorism training. In the United States, first responders are challenged in environmental- and human-initiated threats that require quick decision making and actions (Dahl, 2011; Davis et al., 2004). Citizens and communities rely on the government to be the leader in providing training for first responders in emergency management of disasters, crises, and threats. Before answering the call to mass consequence events, first responders must learn the necessary knowledge, skills, and abilities to perform successfully. For first responders to properly train towards successful individual and organizational performance, they need access to on-demand, geographically independent opportunities for job-relevant learning (Park & Jacobs, 2011; Hager, 2004; Jarvis, 2010).

1.3 Continuing Professional Development (CPD)

CPD is the field of practice and study that includes formal, nonformal, and informal approaches to the continual learning and development of professionals (Eraut, 1994; Jeris, 2010). CPD is used synonymously with lifelong learning (Collin et al., 2012). Although most American research and literature has used the term *continuing professional education* (CPE), this study used the terminology of CPD which is often used synonymously in the literature. There are many other terms associated with CPD including professional learning, professional development, and staff development to name a few (Coady, 2015). Through CPD, many adults keep up with new developments, achieve skill mastery, seek to understand the connections of

their field to related disciplines, and grow as people as well as professionals (Houle, 1980). Since many terms are used to define and represent CPD, it is worth clarifying the term for the purpose of this study. The term *continuing* is used because individuals must have the desire and motivation to continue to learn whether mandated or not. The term *professional* is used because these learners are the people who are in control of their career and their learning. The term *development* is used because these professionals must pursue their own development to provide a great service to those who count on them.

Global research points to the idea that workplace learning, organizational learning, and CPD affect individual and organizational performance regardless of whether the learning is formal, informal, or nonformal (Friedman, 2012; Hager, 2004; London & Sessa, 2007; Park & Jacobs, 2011; Wetta-Hall et al., 2006). Many formal offerings include organized conferences, courses, or educational events (Friedman, 2012; Jeris, 2010). Informal learning has been associated with greater flexibility and freedom (Eraut, 2004). Informal learning activities provide opportunities for research (Bailey, 2015; Eraut, 2004). The control is primarily in the hands of the learners, so self-perception and self-awareness are critical (Collin et al., 2012). Even after professionals have gained formal knowledge as a requirement for their profession, they need further development past their initial training (Bierema & Eraut, 2004). They may need to prove their authority or establish accountability to those they serve (Bierema & Eraut, 2004). Professionals must be able to respond quickly to change (Ross et al., 2013). They must demonstrate responsibility and a commitment to develop themselves beyond school, college, or university programs to be successful (Coady, 2015; Collin et al., 2012; Houle, 1980; Ross et al., 2013). If professionals participate inconsistently or erratically in CPD, then it would seem natural that the quality of their service might also be inconsistent and erratic (Bailey, 2015).

Many national and international entities have begun recognizing that voluntary learning and development as well as lifelong learning continue to increase in importance for individuals, organizations and, ultimately, society (Coady, 2015; Collin et al., 2012).

Many professionals participate in licensing and credentialing programs mandated by their professions (Friedman, 2012). Many occupations have recognized the need to ensure that their professionals continue learning beyond pre-professional education, so they can provide better service over their lifetime of practice (Collin et al., 2012; Houle, 1980; Van Loo & Rocco, 2006). The medical field took the first step in establishing licensure and certification systems in the early 1900s (Cervero & Daley, 2016). During the 1980s, many professions increased their usage of CPD for licensing and certifying.

In 2015, almost 51% of the total workforce, nearly 81 million, were professional workers in the United States (AFL-CIO Department for Professional Employees, 2015). This has doubled from 25% as reported in 1988 (Cervero, 2000; Van Loo & Rocco, 2006). Data also shows that, in CPD, demographics and the work environment may be factors in determining effectiveness (Daley & Cervero, 2016). CPD engagement and continuance are often topics of study in the research. Barriers of interest include personal factors such as energy, motivation, and self-efficacy (Ross et al., 2013). In addition, other barriers in the research include the ability to access appropriate learning opportunities and to physically get to the CPD offering (Ross et al., 2013). Some researchers have also discussed the limitation found in that most providers assume that attendance equals learning (Daley & Cervero, 2016; Webster-Wright, 2009).

1.4 Continuing Professional Development (CPD) and Human Resource Development (HRD)

Although they are independent from each other, the human resource development (HRD) research and the CPD research continue to contribute to each other because of their many

similarities (Daley, 2004; Dirkx & Austin, 2002; Van Loo & Rocco, 2006). A collective set of articles provided a viewpoint on HRD and CPD boundaries including their similarities and differences and where they converge on theory and research (Jeris & Daley, 2004). Even today, it seems the two areas and their knowledge remain on separate paths, but the real world continues to merge them, which keeps citation lists very small (Daley, 2004; Jeris & Daley, 2004). Research refers to them as yoked concepts because of the degree to which they are related (Daley, 2004; Roth, 2004; Sleezer, Conti, & Nolan, 2004). Both manage to provide development that aims at improving individuals' knowledge level, but HRD also emphasizes performance (Sleezer, Conti, & Nolan, 2004; Van Loo & Rocco, 2006). Collaboration between the two fields can assist in theory building and practice development to improve each in many ways (Daley, 2004).

HRD continues to examine its definition, origin, aims, and goals (Bierema & Eraut, 2004; Roth, 2004; Sleezer, Conti, & Nolan, 2004). Kuchinke (2001) referred to HRD as a field with multiple disciplines. Theoretical models from the economics, industrial psychology, adult learning, organizational behavior, and management fields that emphasize systems theory help to shape HRD (Watkins, 1991). Although not the most popular view, research has found a few HRD definitions which recognize that HRD may take place both inside and outside of the workplace (Hamlin & Stewart, 2011). After a thorough review and thematic analysis of definitions that have been shared for HRD, Hamlin and Stewart (2011, p. 210) found four common core purposes, which are

- "improving individual or group effectiveness and performance,"
- "improving organisational effectiveness and performance,"
- "developing knowledge, skills, and competencies," and

- "enhancing human potential and personal growth."

Research shows that it is important to view HRD, CPD, and workforce development as an integrated system while keeping in mind all stakeholders (Bierema & Eraut, 2004; Roth, 2004). When comparing CPD and HRD, a common element is the workplace (Bierema & Eraut, 2004; Roth, 2004). Much of the CPD research fails to connect because scholars and practitioners stay close to organizations within their individual professions (Roth, 2004). More HRD professionals are tasked with managing CPD due to the increased number of professionals having to complete CPD requirements (Sleezer, Conti, & Nolan, 2004; Van Loo & Rocco, 2006). Higher education institutions are not the sole or the primary providers of CPD. CPD providers include professional associations, employers, independent for-profit organizations, and governmental agencies (Van Loo & Rocco, 2006; Sleezer, Conti, & Nolan, 2004). Change is a vital component of success for CPD and HRD when focused on updating knowledge and expertise (Dirkx, Gilley, & Gilley, 2004).

1.5 eLearning

Even though the early 1900s brought about communication and teaching over the radio signals, technology did not take a major leap until much later. Since the 1960s, technology has been experiencing an evolution that has brought it from curiosity to full integration, including teaching and learning, into our daily lives (Harasim, 2000; Kidd, 2010; Lowenthal, Wilson, & Parrish, 2009; Phillips et al., 2011). Harasim (2000) claimed that online learning was born not too long after the invention of email in the 1970s. The world is truly digital, and technology may soon be essential to learning. The world continues to provide many different choices of not only what to learn, but how to learn.

While eLearning is certainly not new, there is still no consensus on its meaning or even the terminology used to describe the concept (Guri-Rosenblit & Gros, 2011; Kidd, 2010;

Littlejohn & Pegler, 2007; Moore, Dickson-Deane, & Galyen, 2011; Phillips et al., 2011). Researchers found that learning environments are often labeled inconsistently. It is best to describe a learning environment by its instructional characteristics which includes the technology used and the actual context (Caudill & Reeves, 2012; Friesen, 2009; Littlejohn & Pegler, 2007; Lowenthal et al., 2009; Moore et al., 2011; Phillips et al., 2011; Slotte & Herbert, 2006). Past research discussed the importance of having the context described when using the terminology so that there is better understanding of how exactly the term is being used, and thus less confusion among practitioners and policy makers.

The issue of having varied expressions and meanings causes difficulty when trying to connect concepts that may be related (Lowenthal et al., 2009). It will be more difficult for generalizations and comparisons unless everyone starts to speak the same language. Another aspect is that eLearning is a multi-disciplinary field and ever changing, therefore it has been evaluated and researched differently (Friesen, 2009; Phillips et al., 2011). Friesen (2009) posited that eLearning research should take the multi-disciplinary field of knowledge to promote more efficiency, effectiveness, and accessibility with better investigation and optimization of its use (Lowenthal et al., 2009). Lowenthal et al. (2009) provided a very good review, synthesis, and expansion of classifications with more specific language to limit some commonly encountered issues. These issues include confounded research results, confused practitioners, and limited course design. Lowenthal et al. (2009) pointed out issues with journal articles and submission restrictions that might have limited the details shared about the eLearning context.

Unfortunately, eLearning does not have a long history of rigorous research (Kidd, 2010; Lowenthal, Wilson, & Parrish, 2009; Phillips, McNaught, & Kennedy, 2011). Overall, much of the research is anecdotal, is not very systematic or empirical, and is not very generalizable to

different audiences (Collin et al., 2012). Much of the research also represents studies conducted on students in higher education (Chen et al., 2008; Kidd, 2010). General searches for eLearning or online learning-related articles manifest many hits. By narrowing the databases used and the types of articles, a more manageable and stronger, yet smaller, literature base is evident (Waight & Stewart, 2009).

1.6 CPD eLearning: Putting it all Together

Many organizations provide CPD in various delivery settings and modalities (Cervero, 2000; Cervero & Daley, 2011, 2016; Coady, 2015; Dirkx & Austin, 2005). More self-directed learning options such as interactive, mobile, and even social media provide greater flexibility to professionals (Cervero & Daley, 2016). CPD has incorporated distance education for a long time, but technology has continued to alter how CPD providers prepare their offerings (Daley, 2004; Roth, 2004; Umble & Dooley, 2004). CPD eLearning has provided an opportunity for professionals to access learning at any time and from anywhere. This study focused on CPD eLearning in a context where learners access and take courses with no interaction from a live instructor nor collaboration with other learners.

Research gives many reasons for opting to use technology as a medium for the delivery of CPD eLearning (Caudill & Reeves, 2012; Daley, 2002; Long, Dubois, & Faley, 2009; Waight & Stewart, 2009). For example, the U.S. economy has been very unstable for quite some time. Given the issue of decreasing budgets, which are under even more scrutiny these days, there is always a search for how to deliver training more efficiently and effectively. The majority of CPD eLearning does not occur at the workplace; often, it is offered by a for-profit provider (Cervero, 2001), a public university, or a governmental agency (Umble & Dooley, 2004). At the same time, CPD offerings, especially in distance education and eLearning delivery formats, have increased in workplaces (Cervero, 2001; Van Loo & Rocco, 2006). Despite the increase in CPD

eLearning over the years, little is known about who participates and what factors may be related to actual completion and continuance. There is a need for CPD eLearning research to take a multi-disciplinary approach to promote more efficiency, effectiveness, and accessibility with improved investigation (Friesen, 2009).

There is often the dilemma of measuring and evaluating success (Umble & Dooley, 2004; Cervero & Daley, 2016). Although they do not charge directly for their services, public sector organizations must produce evidence of the outcomes of their programs (Umble & Dooley, 2004). The need for a more business-minded plan with stronger strategic and marketing focus is evident (Umble & Dooley, 2004). The ultimate winners or losers of CPD eLearning end up being the customers who use or pay for the services (Umble & Dooley, 2004). CPD eLearning must be designed and delivered with quality that will satisfy multiple categories of stakeholders (Umble & Dooley, 2004). The type of transformation necessary for CPD eLearning is usually specific and immediate for individuals as they are expected to perform certain behaviors in any type of setting (Caudill & Reeves, 2012; Ubell, 2010).

Adult learner characteristics, instructional design, and the comfort of the technology may affect CPD eLearning continuance (Umble & Dooley, 2004). However, lack of time, course enrollment procedures, low employee motivation, and employee turnover have been found to affect CPD eLearning success in the educational and work contexts (Long, Dubois, & Faley, 2009). Adult learners may also feel that their needs are not being met, and they subsequently may not complete the course or program (Umble & Dooley, 2004). Barriers to completion may vary in specificity, but Umble and Dooley (2004) classified most to be situational, institutional, dispositional, or epistemological. Situational barriers included a poor learning environment or other responsibilities of the learners. Institutional barriers included cost or institutional

procedural problems. Dispositional barriers included those that are more inherent to individuals such as time management, interest, motivation, and attitude towards the content. Some research cites that communication techniques and self-efficacy may also be barriers to assess (Umble & Dooley, 2004).

1.7 Satisfaction to Continuance (Intentions and Behaviors)

Both practitioner reports and scholarly research show the global outlook will continue to have great growth in the availability of self-directed, self-paced CPD eLearning (DeRouin et al., 2005; Docebo, 2014). Learners have a choice in selecting and completing CPD eLearning. For those who make the initial investment, the ultimate return is not realized if people do not use the CPD eLearning (Lee, Hsieh, & Hsu, 2011). Research has called attention to the importance of studying completion barriers to voluntary CPD eLearning, including the need to determine whether host organizations achieve a return on investment (Long, Dubois, & Faley, 2009).

Many factors affect whether or not individuals will do something or take action on something. In CPD eLearning, learners must adopt the particular technology that is acceptable for their need. Thereafter, continuance is predicated on their decision to continue with their initial choice. Fishbein (1967) provided early research on the Theory of Reasoned Action (TRA) which discussed individuals' attitudes as well as the importance of how others perceive and react to particular actions. The choice to choose and continue CPD eLearning can certainly involve the perceptions of the learners, their supervisor, their organization, and even their colleagues. The Theory of Planned Behavior (TPB) extended the TRA by incorporating the possibility of constraints that have been placed on individuals when their intentions have been to behave in a particular manner. The perceived behavior control defined individuals' perceived level of difficulty to perform a behavior. This is generally classified on a continuum based on the level of difficulty for several areas including effort and resources (Ajzen, 1985). Earlier research

already established the link between satisfaction and post-purchase decisions (Oliver, 1980) and, in this case, continuance behavior or actual use.

An advantage of CPD eLearning that may relate to first responders includes the asynchronous aspect for its flexibility and ease of access (Caudill & Reeves, 2012). Because often times eLearning is a self-selection decision (considered informal training) that learners complete as a self-paced and self-directed model (Bailey, 2015; Moore et al., 2011), Long et al. (2009) identified barriers and issues to completion. Some of these barriers included lack of time, poor course enrollment process, low employee motivation, and employee turnover.

Moreover, there is a great deal of interest in research related to CPD eLearning, and specifically pertaining to reasons for dropouts and attrition as well as completion rates and contributing factors to persistence in eLearning (e.g. Hardman & Robertson, 2012; O'Connor, Sceiford, Wang, Voucar-Szocki, & Griffin, 2003; Umble & Dooley, 2004). Hardman and Robertson (2012) also discussed some success factors associated with adult learning participation which included being younger, having higher levels of education, having a job, being highly skilled, having a white-collar job, and working at a large organization (Tuijnman & Boudard, 2001).

Related studies have addressed continuance intention (e.g., Chiu, Hsu, Sun, Lin, and Sun, (2005); Chiu, Sun, Sun, & Ju., 2007; Chiu & Wang, 2008; Liao et al., 2007; Roca et al., 2006; Waight & Stewart, 2009). The actual learning experience is credited with being important in learners' beliefs, attitudes, and continuance intention. Roca et al. (2006) explored expanding the Technology Acceptance Model (TAM) by using constructs from the Expectation Disconfirmation Theory (EDT) as well as including quality elements from DeLone and McLean (1992). If this occurred, organizations such as the eLearning provider in this study might

experience high attrition and high incompletion rates. O'Connor et al. (2003) recommended that organizations not use the eLearning dropout rate as a primary indicator of success; they did recommend, however, that organizations review the design, implementation, supporting system and overall strategy if the attrition rate reaches 50% or greater. Continuance intention and continuance, or actual use, definitely warrant some attention (Lin, 2011).

1.8 Statement of the Problem

Many individuals, organizations, and associations have found eLearning to be the best method of delivery for CPD (National Intelligence Council, 2012; Russ-Eft et al., 2014; Umble & Dooley, 2004). CPD eLearning uses technology to engage adult learners in continuing professional development (Coady, 2015; Umble & Dooley, 2004). Agencies, associations, and other organizations often offer CPD eLearning as a way for adult learners to progress or maintain their status in their professional careers (Clark & Mayer, 2003; Merriam, Caffarella, & Baumgartner, 2007; Moore, Dickson-Deane, & Galyen, 2011; Phillips et al., 2011). Although CPD eLearning seems to be an ideal delivery means for efficiently distributing standardized cost-effective training, a significantly low percentage of enrolled learners complete the training through this delivery format (Jun, 2004, 2005; Long, Dubois, & Faley, 2009).

There is existing research on CPD eLearning, but it is limited in these three ways. First, there are different outcome measures of success. Learners all have their own perception of the quality of the training (Sleezer, Conti, & Nolan, 2004). Too often learner satisfaction and program success are measured as the number of learners that actually complete courses (Chiu et al., 2005; Levy, 2007). Feedback may also need to be collected from learners who did not complete the entire course so that a full view of whether CPD eLearning was successful can be obtained. Second, overly simplistic models may not control for the degree to which these variables simultaneously (or even interactively) contribute to the learning experience. Several

factors must be balanced to develop a more holistic understanding of CPD eLearning. Research designs that omit any of these variables might overlook the chance to explore the relationship of satisfaction to continuance behavior starting with learners' expectations and perceptions. High dropout failure rates, avoidance of courses due to poor quality reputation, poor learning outcomes as well as poor return on investment limit training effectiveness and spotlight the importance of understanding mechanisms and factors that enhance learner satisfaction with and completion of professional development (Baskett & Marsick, 1992; Ke, 2010; Li, Brake, Champion, Fuller, Gabel, & Hatcher-Busch, 2009; Merriam et al., 2007). The third limitation is that many models do not account for actual continuance in the design. This does not allow the researcher to fully understand how learner satisfaction leads to continuance and actual training completion.

A pervasive CPD eLearning problem is that many learners do not complete the courses they begin (Jun, 2004, 2005; Long, Dubois, & Faley, 2009). Since learners did not continue or complete the course material, many view those courses as failures or as an unsuccessful result of eLearning. After all, it is impossible to count or evaluate learner completion that does not exist (Sun, Tsai, Finger, Chen, & Yeh, 2008).

As progress into this digital age continues, more associations and organizations want to increase their online course and program offerings because of the benefits offered by eLearning as evidenced in the 2012 ASTD State of the Industry Report (Miller, 2012). Although Kirkpatrick reactions criteria is often used as an evaluation for training in isolation (Kirkpatrick & Kirkpatrick, 2007), critics of the model point out that within the CPD eLearning context, learners have to continue and complete eLearning to give this feedback. Therefore, this criteria

alone does not sufficiently assess or predict learner satisfaction with CPD eLearning or their continuance behavior.

The CPD eLearning process involves many procedures and systems. First, CPD eLearners are motivated intrinsically or extrinsically to select eLearning as their preferred learning format for a particular topic (Deci, Koestner, & Ryan, 2001). Even before learners fill out an online registration form, they have established expectations on the quality of that training (Oliver, 1977, 1980 ; DeLone & McLean, 1992). Learners have already begun asking themselves these quesitons. Will the system work properly? Will the content be what I need? Will the provided service meet my needs? Then, after registering in the CPD eLearning used in this study, learners were issued a user name and password along with the website information so they could enter the learning management system (LMS). Once they logged in, learners could take several courses. All courses had a pre-test module, one or more content modules, and a post-test module. Learners could contact CPD eLearning representatives through email or by phone with questions or for assistance. Learners could even chat online through the LMS. Some learners even sent their communications through Facebook, Twitter, and YouTube. Through this process, the learners began forming perceptions based on their initial expectations. This determined, in turn, if the learners were satisfied and, ultimately, their intention and actual continuance in the courses (Oliver, 1980). Also, learners initial motivation to register for CPD eLearning provided some insight on whether they ultimately completed a course (Deci et al., 2001).

As depicted in Figure 1, this study focused on CPD eLearning continuance, or the process of progressing through a training program until completion. This researcher suggested that learner expectations were very important factors that affected the outcome and success of CPD

eLearning. When learners decided to participate in CPD eLearning, they began with an anticipation of performance (Churchill & Suprenant, 1982; Oliver, 2014). These expectations and perceptions included specifics on the content, the system, and the service in CPD eLearning. Researchers have long studied how people react when there is a discrepancy between their expectations and their perception of actual performance (Anderson, 1962). Anderson (1962) presented the concept that those whose expectations were too high might have had an even lower level of satisfaction than those who began with lower expectations. Many have built upon that concept and have connected from disconfirmation to satisfaction, which then affected the intent to continue using a particular service or product (Oliver, 1977). In this context, if learners were satisfied with CPD eLearning, they continued to complete the CPD eLearning as they intended. This experience also helped them set expectations for their next CPD eLearning experience. Because motivation has also been discussed in the literature as a critical factor for determining the success of CPD eLearning, the construct is introduced as a moderator between satisfaction and continuance intention and between satisfaction and continuance behavior (Chen & Jang, 2010; Sorebo, Halvari, Gulli, & Kristansen, 2009).

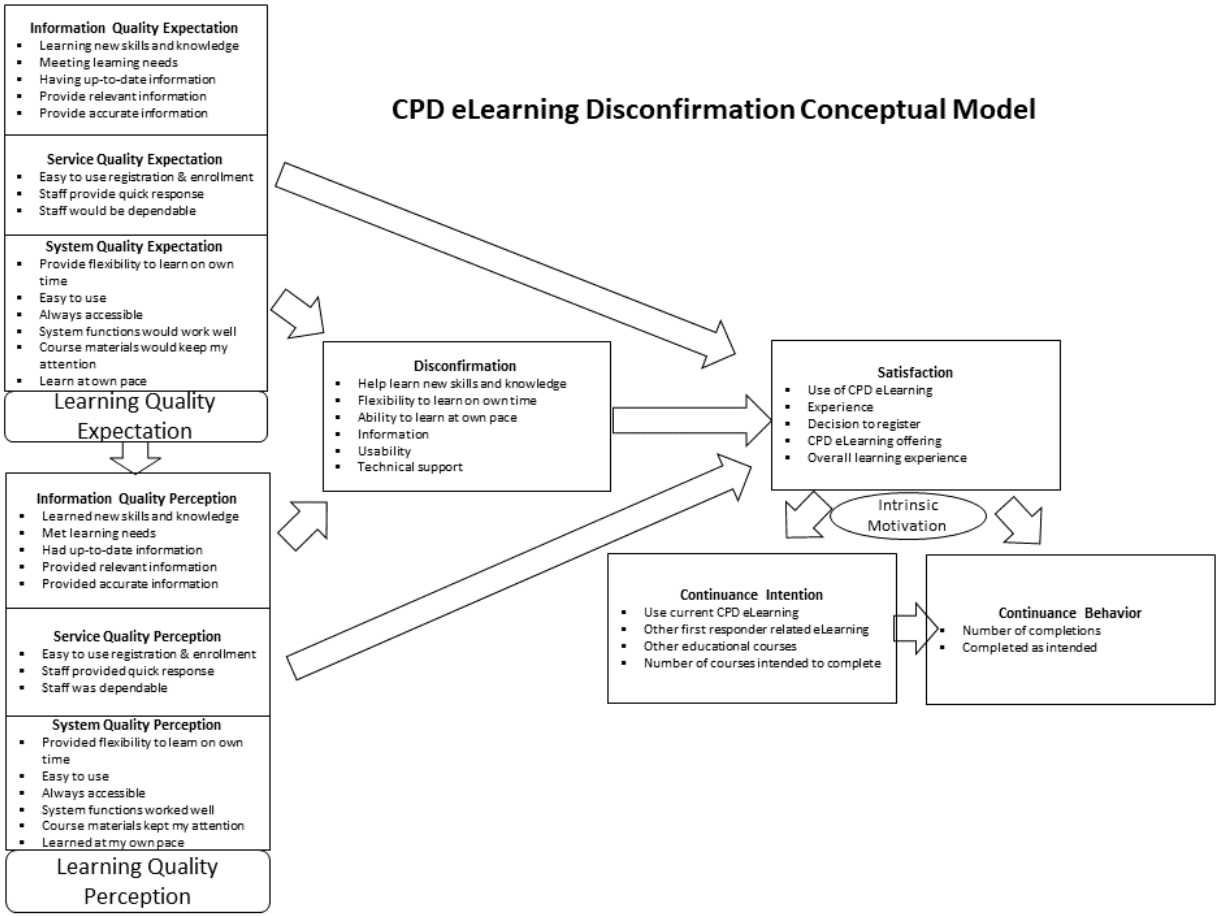


Figure 1. The conceptual framework used in this study.

As illustrated in (Figure 1), the conceptual framework in this study assumes that learners form initial quality expectations. Learners then compare their expectations to their perception of the actual events after they have begun participating in CPD eLearning. That comparison of their expectations and perceptions is related to the positive or negative disconfirmation choice. This disconfirmation then has a direct bearing on the learners' satisfaction level of CPD eLearning. Learners' satisfaction is also associated with both continuance intention and actual continuance behavior. Continuance intention has also been shown in some instances to predict and correlate to actual continuance behavior. As a moderating variable, motivation is theorized to have a significant relationship with continuance intention and actual continuance behavior.

The Expectation Disconfirmation Theory (EDT) has sought to explain satisfaction as an outcome of expectations, perceptions of performance, and disconfirmation of people's beliefs (Oliver, 1980). The main components of this conceptual framework include Expectation, Perception, Disconfirmation, Satisfaction, and Continuance Intention. Combining this model with details from motivation research and the DeLone and McLean (2003) Information Systems Success (D&M ISS) model to also focus on the quality and actual use of eLearning may provide a stronger model for CPD eLearning continuance behavior. The research model and hypotheses present the influence of satisfaction on continuance behavior through the theoretical lens of the EDT.

The researcher for this current study postulated that understanding learning quality expectations and perceptions could assist in interpreting when CPD eLearners are satisfied and when they have completed courses. Also included within those expectations and perceptions are variables that specifically look at expectations and perceptions in the areas of information quality, system quality, and service quality based on the D&M ISS model. This model has a long line of previous studies in the area of information systems and technology that have aimed to show the relationship between these quality constructs and, subsequently, usage intentions, usage satisfaction, and net system benefits. Equally important, this study built upon studies that showed that satisfaction affects continuance intention and actual continuance behavior. As a moderating variable, motivation is also proposed to have an effect on continuance intention and actual continuance behavior.

1.9 Purpose of this Study

In an attempt to investigate factors that may account for CPD eLearning satisfaction and completion, this study examined first responders enrolled in a CPD eLearning training course. The examination's focus was to understand the relationships the learners expressed in relation to

their expectations and perception of eLearning quality, disconfirmation, and satisfaction. This investigation also explored whether learner motivation moderated the relationship between satisfaction and continuance intention or satisfaction and actual continuance behavior. The investigation employed a survey of variables selected through an extension of EDT in order to understand the CPD eLearning experience of first responders.

1.10 Research Objectives and Questions

This research set out to empirically test and address the following:

1. The learning and development industry uses a misspecified model. To date, few studies have included the measure of quality (DeLone & McLean, 2003) in the expectation, perception, and disconfirmation constructs.
    a. What are the relationships between expectations and perceptions of CPD eLearning as they relate to the quality of information, service, system, and overall learning?
    b. In what way do expectations and perceptions of quality relate to disconfirmation?
2. To propose a theory that better explains the actual link between satisfaction and continuance. By not including the constructs of motivation and actual continuance behavior, the research model may not fully describe relationships and results that may be associated with CPD eLearning continuance intention.
    a. Is there a difference between those CPD eLearners who report satisfaction versus those who are dissatisfied with CPD eLearning? How do the expectations, perceptions, and levels of disconfirmation relate to their level of satisfaction of CPD eLearning?

b. What is the relationship between satisfaction and continuance intention of CPD eLearning?
c. What is the relationship between satisfaction and continuance of CPD eLearning?
d. Does motivation moderate the relationship between satisfaction and continuance intention?
e. Does motivation moderate the relationship between satisfaction and actual continuance?

1.11 Significance and Contribution of Study

Investigation into improved CPD eLearning practices among first responders stands to benefit society by improving the professional learning capacities of a much-needed workforce (e.g., EMS, firefighter, etc.). In addition, such investigation may also benefit eLearning practices by improving the quality and design of CPD eLearning in workplaces that depend on it for essential training and professional development needs.

In addition to the applied contributions, the scientific aspect of this research intends to open the door to combining previously used theories from other areas of research and to test a model that incorporates learner expectations of quality, perceptions of quality, disconfirmation, and satisfaction to provide a more holistic understanding of the eLearning process. For practical purposes, qualitative feedback on information, system, service, and overall learning quality provides more detailed insight into the factors that enhance (or detract from) CPD eLearning. Training sponsors and hosts can use this insight to improve the training process and to lead the industry to a better understanding of what affects learners' intentions to complete CPD eLearning.

This study contributes to the global discussion in the following areas:

1. This study adds to the EDT literature on motivation, quality, and continuance.
2. This study adds to the CPD literature on eLearning and first response.
3. This study adds to the eLearning literature on first response and CPD.
4. This study adds to the HRD literature on first response, eLearning, and CPD.

Challenges to CPD eLearning have been well-documented (Ke, 2010; Pereira, Ramos, Andrade & Oliveira, 2015; Rey Moreno, Rufín Moreno & Medina Molina, 2013) and have carried both scientific and practical importance, as described in what follows. Learners who drop out of CPD eLearning courses do not typically evaluate the training programs; this results in an incomplete understanding of the role of learner satisfaction on training completion (Jun, 2004, 2005; Long, Dubois, & Faley, 2009; Sun et al., 2008). The reasons for opting out of trainings are not fully understood. This study aimed to address this knowledge gap by shedding light on the mechanisms and factors that link CPD eLearning satisfaction, continuance, and actual continuance behavior (Pereira et al., 2015; Rey Moreno et al., 2013) within the first responder setting.

Practical use may be found by those who create and manage CPD eLearning if a relationship can be found in learner satisfaction that may help to increase completion rates by optimizing factors and constructs investigated in this study. Policy makers and researchers alike can gain necessary insight from this study, which aimed to understand CPD eLearning quality expectations, perceptions (Chiu et al., 2005; McKinney, Kanghyun, & Zahedi, 2002), and satisfaction from a broad spectrum of first responders (Donavant, 2009; Liang & Wu, 2010; Wetta-Hall, Fredrickson, Ablah, Cook, & Molgaard, 2006). Practitioners and scholars seeking a better understanding of CPD eLearning success can benefit from a more robust research design that incorporates a comprehensive set of theoretical variables which are thought to influence

adult learner satisfaction and continuance. A better understanding of how these factors affect learner satisfaction and training completion would allow practitioners to develop better CPD eLearning systems, procedures, and support systems, which would improve these valued human resource training and development outcomes.

Further investigation is necessary to analyze the relationships among CPD eLearner expectations, satisfaction, motivations, intentions, and completions. When course evaluations are conducted only after course completion, the perspectives of those learners who did not continue or complete the learning are omitted from consideration.

CHAPTER 2. LITERATURE REVIEW AND STATEMENT OF HYPOTHESES

"Professions do not become obsolete, but professionals can." (Hoberman, Mailick, & Ebert, 1994)

The following section reviews the literature as it relates to the purpose of this study and provides the basic rationale for this study's research hypotheses.

This study set out to investigate the CPD eLearning satisfaction and completion phenomenon of adult learners. Given the importance of this question to high-demand, high-criticality, and highly dynamic fields, observation for this study focused on first responders. The goal was to advance understanding in the relationships among expectations of quality, perceptions of quality, disconfirmation, and satisfaction of first responders who complete CPD in an eLearning environment. This investigation also explored whether first responders' motivation moderated the relationship between satisfaction and continuance intention or satisfaction and actual continuance behavior. This study focused on why first responders choose CPD eLearning and why they continue in CPD eLearning.

This study extended the Expectation Disconfirmation Theory (EDT) to investigate relationships among expectations of quality, perceptions of quality, disconfirmation, and satisfaction by examining continuance intention and actual continuance behavior in CPD eLearning. This research also examined the role of motivation as a moderating factor and its importance to satisfaction and continuance. Ultimately, this research sought to test a model that would improve the understanding of variable relationships as it related to satisfaction, continuance intention, and actual continuance behavior.

As indicated in the conceptual framework (Figure 1), this study borrowed the notion of CPD eLearning continuance as a sequential process that ultimately results in a cyclical learning

loop. As an initial step toward understanding the CPD eLearning process, this study adopted the first loop in the cyclical sequence beginning with developing learning expectations, to perceptions that emerge during the learning process and which result in ultimate reflections on the satisfaction with the learning experience. The resulting sequence model was the basis for EDT integration into this study's proposed model. Given the complexity of the model, the following discussion dissects the CPD eLearning process into two parts: first, elaboration on the development of expectations, and second, discussion of learners' appraisal of learning quality.

This research was interested in investigating why adults engage in the act of learning. Furthermore, it is important to know how adults' expectations, satisfaction, and motivation play a part in their continuance intentions and behavior. When other types and mediums are introduced in how content and learning are delivered, other factors may play a part in whether or not adult learners choose to continue the learning.

2.1 Expectation Disconfirmation Theory (EDT)

The Expectation Disconfirmation Theory (EDT) originated in the marketing and consumer behavior areas, but it has been applied to many other contexts including technology where the term *Expectation Confirmation Theory (ECT)* has been used. EDT can also be applied in areas of adult learning and organizational development; after all, adults involved in learning and training are consumers who demand quality and satisfaction (Dominici & Palumbo, 2013).

Early researchers laid the foundation to support the importance of understanding how consumers react when there is disparity between their expectations and their perceptions of actual performance (Anderson, 1962). Additionally, studies have connected satisfaction to continuance intention and actual continuance or usage (Tse, Nicosia, & Wilton, 1990). Acceptance is defined as the initial adoption, whereas continuance is subsequent continued usage

(Chiu et al., 2005). This research study was interested in learning more about factors that may affect continuance in eLearning.

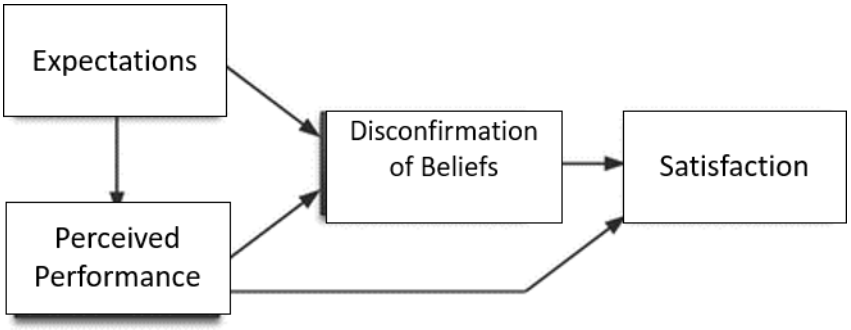


Figure 2. This is Oliver's (1977) expectation disconfirmation theory (EDT) model.

Early models (Figure 2) advocated that satisfaction depended on expectation and expectancy disconfirmation (Oliver, 1977). Oliver (1977) further emphasized the importance of measuring disconfirmation separately since it had an independent, additive effect on satisfaction (Anderson, 1973). The EDT model proposed three possible outcomes: positive disconfirmation (perception exceeds expectation), confirmation (perception meets expectation), and negative disconfirmation (perception does not meet expectation). Positive disconfirmation was the only one that led to satisfaction since negative disconfirmation led to dissatisfaction (Churchill & Suprenant, 1982). This left those in the confirmation stage feeling neutral or indifferent.

EDT initially focused on consumer behavior in purchasing. Later, it proposed that satisfaction depended on consumers' expectations and perceptions of performance after the purchase (Oliver, 1977). A better view of the relationships among expectation, disconfirmation, satisfaction, attitude, and purchase intention was provided through an actual purchase situation and some time for usage (Oliver, 1980). This research operationalized the expectation, disconfirmation, and satisfaction constructs while including individuals who did not make a purchase. Earlier studies had used the change score between the attitude and expectation levels to generate the disconfirmation result, but Oliver (1980) operationalized disconfirmation as a

measure of overall better- or worse-than-expected scales. Subsequent years provided examination of EDT in other areas including psychology, government (Van Ryzin, 2013), and outsourcing (Schwarz, 2011), for example. More recent research has introduced EDT into the technology field in adoption and usage studies (Bhattacherjee, 2001; Chiu et al., 2005). However, technology is a multi-faceted field where not all technology is created equally.

Many current technology-focused studies have modified the EDT and have referred to it as the Expectation Confirmation Theory (ECT), or even the Expectation Confirmation Model (ECM). Bhattacherjee (2001) added to the literature by examining continued use in technology, thereby extending this model. He posited that expectations are influenced by previous encounters and use. Users make an initial decision. Then, they are influenced by their initial use. Finally, they can then decide to reverse their initial decision based on their satisfaction level. Bhattacherjee (2001) shifted the focus from EDT to ECT and introduced the Information Technology (IT) Continuance model. One significant difference from the EDT was that Bhattacherjee (2001) posited that perceived usefulness along with satisfaction helped to determine continuance intention. Another deviation from the EDT was that this model used a confirmation scale versus disconfirmation measures. Disconfirmation and satisfaction were found to be critical and essential in understanding changes in attitudes as well as technology usage (Bhattacherjee & Premkumar, 2004).

More recent studies have analyzed many factors to help determine constructs and relationships that affect continuance in technology (Bhattacherjee, 2001). Bhattacherjee, Perols, and Sanford (2008) extended the IT Continuance model based on cognitive psychology literature. They looked at the effect of self-efficacy and facilitating conditions on continuance intention and behavior. Furthermore, they provided an extended model that included evidence of

continuance intention as a significant predictor to continuance behavior (Bhattacherjee et al., 2008). The base model included post-usage usefulness, disconfirmation, satisfaction, and continuance intention while the proposed and tested model included the base model plus IT self-efficacy, facilitating conditions, and continuance behavior. All of the base model constructs had a positive effect on continuance intention, which then led to the effect on continuance behavior (Bhattacherjee et al., 2008). Disconfirmation had a positive effect on satisfaction and post-usage usefulness (Bhattacherjee et al., 2008). Satisfaction also had a positive effect on continuance intention (Bhattacherjee et al., 2008).

Other researchers have also proposed modifications to EDT that combine other related theories. The Technology Acceptance Model (TAM), built upon Ajzen and Fishbein's (1973) previous research, focused on the ultimate relationship between behavioral intention to use and actual system use (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). However, unlike the EDT, perceived usefulness and perceived ease of use were the constructs specified to determine continuance intention. The TAM (Davis et al., 1989) set out to explain users' intention in and their behavior toward using technology. Perceived usefulness and ease of use were identified as the primary predictors of users' attitudes and would affect their usage of the technology. Premkumar and Bhattacherjee (2005) integrated the TAM and EDT at an attempt to form a stronger model for explaining continuance intention and behavior rather than looking at it through separate lenses. They provided a contrasting explanation of how TAM looked toward future use, and EDT gave a retrospective view based on current usage. TAM looked at beliefs, attitudes, and behavior while EDT focused on expectation, disconfirmation, and satisfaction.

This study has proposed a model based more closely on the original model suggested by Oliver (1977, 1980). More recent studies have not included all constructs originally found in the

EDT, which include expectation and disconfirmation. Additional extensions that go beyond the model initially tested by Oliver in 1980 have been applied. The goal of this and other technology continuance research was to provide better ways to predict actual continuance behaviors (Bhattacherjee et al., 2008). Whether it was persistence, retention, actual use, continued use, or completions, studies have had an opportunity to look beyond continuance intention to better understand which relationships affect training completion (Bhattacherjee, 2001; Davis, 1989; Lowenthal et al., 2009). From the EDT literature, this study has focused on and employed the following constructs: expectation, perception, disconfirmation, satisfaction, continuance intention, and continuance behavior.

Hossain and Quaddus (2012) conducted a review of the literature on articles that addressed the EDT, ECT, or the ECM between 2001 and 2010. After 43 peer-reviewed articles, it was clear that satisfaction was the most important construct in retention and loyalty (Hossain & Quaddus, 2012; Oliver, 1999). Most of the selected studies were empirical and conducted in a university setting (Hossain & Quaddus, 2012). They also found that the majority of these studies focused on continuance intention, and that most of the studies used the TAM or the Theory of Planned Behavior (TPB) as the theoretical perspective in addition to EDT (Hossain & Quaddus, 2012). Most studies were set around individuals, rather than organizations, as the decision makers. Online services were the primary area of focus among the majority of studies. The review of the dependent variables displayed preference of Continuance Intention versus Actual Continuance Behavior in most studies (Hossain & Quaddus, 2012). Of 43 articles, 13 articles studied Satisfaction as a dependent variable (Hossain & Quaddus, 2012). The top independent variables, in descending order, were Confirmation (Positive Disconfirmation), Satisfaction, Perceived Usefulness, and Expectation (Hossain & Quaddus, 2012). The research represented

various countries across the globe. Hossain and Quaddus (2012) showed that there was a great deal of research between 2000 and 2008, but then the research leveled off. Anol Bhattacherjee was cited as having the most publications on the subject of EDT in the IS/IT context. This chapter has cited some of Hossain and Quaddus's (2010) previous work, which discussed how EDT might not work well for explaining CPD eLearning satisfaction or continuance when CPD eLearning is mandatory. Users gain nothing by determining how they feel about something if they cannot choose to discontinue its use. They did discuss, however, the benefits of knowing the users' satisfaction for diffusion purposes (Hossain & Quaddus, 2010). One interesting suggestion was also made about organizations setting lower expectations so that satisfaction can always be higher. So, which is the best approach—to increase performance or lower expectations?

2.2 DeLone and McLean Information Systems Success (D&M ISS) Model

Since CPD eLearning is delivered through an information system (IS), the researcher reviewed prior IS theories for conceptualization of additional constructs used in this study (Wang, Wang, & Shee, 2007). Prior studies found evidence linking quality to satisfaction and continuance in various technology contexts from online shopping websites (Liao, Liu, Liu, To, & Lin, 2011) to eLearning (Cheung & Lee, 2011; Chiu et al., 2005; Eom, Ashill, Arbaugh, & Stapleton, 2012; Pereira et al., 2015; Roca, Chiu, & Martinez, 2006). In particular, the D&M ISS model proposed, after an extensive review, that many measures defined success for IS (DeLone & McLean, 1992). This well-researched model has been employed in many different settings to predict continuance intention and behavior.

DeLone and McLean (1992) initially suggested that six categories could measure the true success of a system that uses technology. The categories included the following: Information Quality, System Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact.

Though these different measures were considered independent, they were also interdependent in how they affected success. Researchers validating the D&M ISS model also examined the viability of incorporating the SERVQUAL instrument (Parasuraman, Zeithaml, & Berry, 1988), which assessed the quality of service on several dimensions including tangibles, reliability, responsiveness, assurance, and empathy, along with the D&M ISS model to better measure the overall effectiveness of IS (Pitt, Watson, & Kavan, 1995). This led to an update, which later suggested that the service quality construct was a very critical addition to this model (DeLone & McLean, 2003). As shown in Figure 3, the D&M ISS model also improved a few of the constructs measured, which at that time included System Quality, Information Quality, Service Quality, Usage Intention, System Use, User Satisfaction, and Net System Benefits.

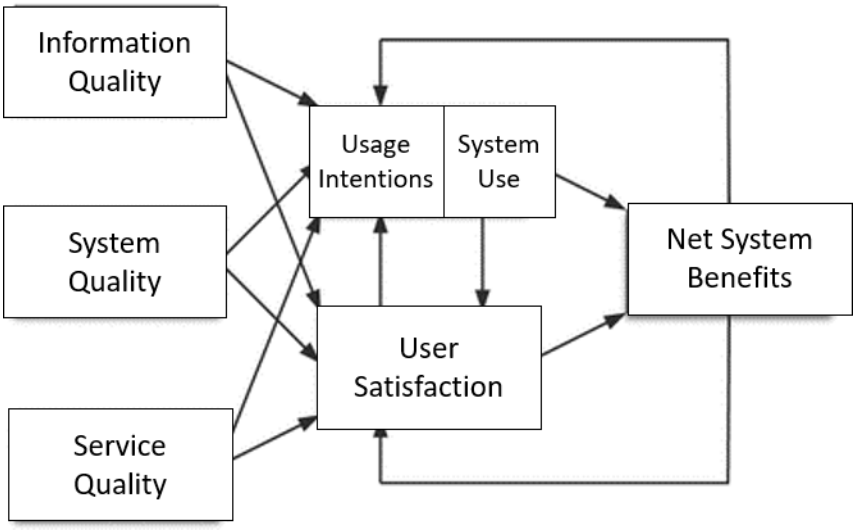


Figure 3. This is the DeLone and McLean (2003) information system success (D&M ISS) model.

Using the D&M ISS model (DeLone & McLean, 1992, 2003) in this study provided the opportunity to measure the expected and perceived performance of the information, system, and service quality experience in CPD eLearning while also incorporating an overall learning quality measure. The variables of interest from the D&M ISS model for this study are the following:

System Quality, Information Quality, Service Quality, Intention, Use, and Satisfaction (Petter & McLean, 2009). With satisfaction as the primary focal point, many studies have synthesized models focused on both expectation and quality (Koo, Wati, Park, & Lim, 2011; McKinney et al., 2002). While McKinney et al. (2002) provided an example that included perceived performance and disconfirmation, Koo et al. (2011) included the perceived usefulness and confirmation constructs. Previous research has investigated perceived quality (Chiu et al., 2005; Isik, 2008; Pereira et al., 2015) and quality disconfirmation (Chiu et al., 2005; Pereira et al., 2015). However, the expectation construct has rarely been included in models that have examined overall quality of CPD eLearning. Research has supported CPD eLearning quality as being positively related to satisfaction (Sun et al., 2008). Some studies have deconstructed the characteristics of the LMS to include information quality, system quality, and service quality (Al-Busaidi, 2012). Lin's (2007) empirical analysis found that information, system, and service quality had a strong and significant influence on satisfaction and continuance intention.

Based on the above literature review, this study synthesized the EDT and the D&M ISS models to investigate CPD eLearning satisfaction, continuance intention, and continuance behavior. The researcher proposed measures to fit the context and the CPD eLearning experience found in this first responder community. The hypotheses in this study built on previous findings primarily related to additional theories and models in several areas of research such as marketing, service quality, information systems, evaluation, and eLearning. Associations among eLearning expectations, perceptions, and satisfaction were investigated with a link from satisfaction to continuance intention and actual continuance behavior being partially moderated by motivation. The model and rationale for each of the hypotheses has been included in the following sections.

This study was designed to examine first responders' continuance intention and continuance behavior in CPD eLearning. The method of this study was to extend the EDT through an investigation of relationships among expectations of quality, perceptions of quality, disconfirmation, satisfaction, and motivation (Figure 4). In addition, this research set out to draw attention to motivation as a moderating factor and its importance to satisfaction and continuance. In this study, learners reported continuance in terms of the amount of CPD eLearning they have completed. These areas included a pre-test, the content, and a post-test. This study also collected information on the number of CPD eLearning courses that learners started and completed.

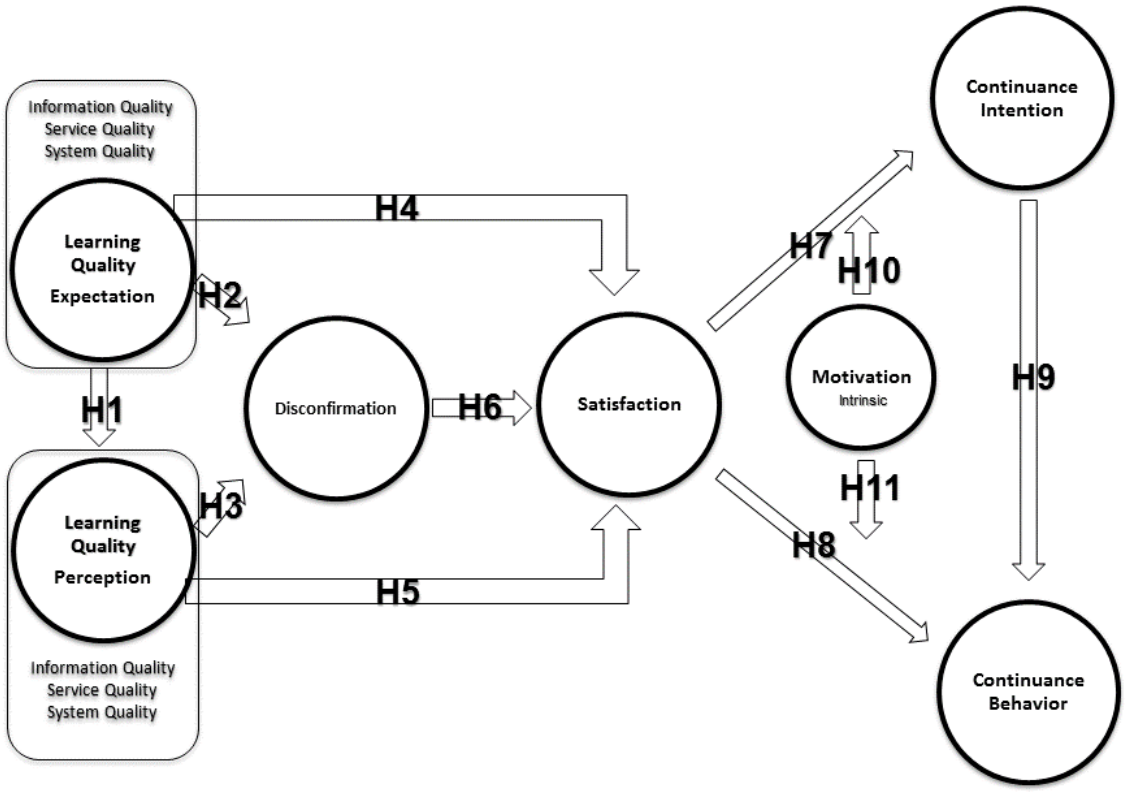


Figure 4. The proposed research model including this study's referenced hypotheses.

Although adult learning is central to both HRD and CPD, differences do occur when measuring quality and identifying important outcomes (Sleezer, Conti, & Nolan, 2004). At its core, CPD relies on individual learning or andragogy; HRD relies on theories based on knowledge, actions, and interactions which lead to contribution to a larger organization or collective entity (Merriam & Brockett, 2011; Sleezer, Conti, & Nolan, 2004). HRD tends to measure satisfaction, learning, and performance (Sleezer, Conti, & Nolan, 2004). Overall improvement of professions calls for quality controls in evaluation of CPD programs (Houle, 1980; Sleezer, Conti, & Nolan, 2004). Program evaluation in CPD generally focuses on the individual and may include level of learner satisfaction and a measure of participation (Houle, 1980; Sleezer, Conti, & Nolan, 2004). Ultimately, another CPD program measure may include the contribution that professionals make to an overall profession. HRD tends to seek out both financial and nonfinancial outcomes (Sleezer, Conti, & Nolan, 2004). In the end, both CPD and HRD generate outcomes that affect performance at all levels (Sleezer, Conti, & Nolan, 2004). Quality in CPD tends to focus on feedback from and about the individuals (Sleezer, Conti, & Nolan, 2004).

"…learning is a multidimensional phenomenon" (Merriam, 2008, p. 93).

2.3 Expectation and Perception (Hypothesis 1)

Within the Expectation Disconfirmation Theory, Oliver (1980) established that the belief about a product or service influenced people's view of how that product or service truly performed. Many researchers have posited that initial perceptions or attitudes, no matter how they are obtained, are considered to influence people's expectation of a product or service (Spreng, MacKenzie & Olshavsky, 1996). This expectation is used to compare to the actual encounter or use of the product or service. Venkatesh, Thong, Chan, Hu, and Brown (2011) found through their research that result measures between initial beliefs (before use) and

modified beliefs (after use) were very consistent. Without both the expectation and perception component, an accurate evaluation is unobtainable because not all consumers or learners are looking for the same thing (Jiang, Klein, Parolia, & Li, 2012, Mckinney et al., 2002; Oliver, 1981; Spreng et al., 1996). Too high of expectations of CPD eLearning may produce a more negative perception of performance by the first responders (Oliver, 1980). Overall, testing this relationship has been mixed in the research. There are some studies that measure expectations (e.g., Bhattacherjee & Premkumar, 2004; Spreng et al., 1996), and there are some that do not measure expectations (e.g., Chiu et al., 2005).

Despite these mixed views on testing the relationship, a few researchers have continued to use this lens to establish a relationship between expectation and perception. Premkumar and Bhattacherjee (2008) included both of these constructs, but they did not test the relationship between the two. Lankton and McKnight (2012) reviewed the EDT model extensively with and without the perception of performance construct. They found that including this construct revealed more assimilation and asymmetric effects. Performance was easy to measure, yielded significant predictive power, and provided an improved overall understanding of satisfaction (Lankton & McKnight, 2012). Other studies have only looked at the perception of performance construct without explicitly measuring the expectation construct (Chiu et al., 2005; Roca et al., 2006). Although Pereira et al. (2015) investigated the relationship between the quality measure and the perception of performance construct, that investigation omitted the expectation construct.

Researchers have also varied the focal attributes of certain constructs within the expectation and perception constructs (Churchill & Suprenant, 1982; Pereira et al., 2015). Some investigations have measured expectations and/or perceptions of the following: skills and knowledge (Koo et al., 2011; Premkumar & Bhattacherjee, 2008), flexibility (Premkumar &

Bhattacherjee, 2008), usefulness (Hsu, Yu, & Wu., 2014; Koo et al., 2011; Lankton & McKnight, 2012; Lee, 2010; Roca et al., 2006), ease of use (Hsu, Yu, et al.., 2014; Lankton & McKnight, 2012; Lee, 2010; Roca et al., 2006), information quality (Hsieh, Kuo, Yang, & Lin, 2010; Koo et al., 2011; Lee, 2010; Lin, 2007; McKinney et al., 2002; Udo, Bagchi, & Kirs, 2011; Wang et al., 2007), system quality (Hsieh et al., 2010; Lin, 2007; McKinney et al., 2002; Wang et al., 2007), service quality (Lin, 2007; Udo et al., 2011; Wang et al., 2007), enjoyment (Lee, 2010), eLearning or other quality (Chiu et al., 2005; Udo et al., 2011), and usability (Chiu et al., 2005).

Several studies have measured the expectation of quality and/or the perception of quality either explicitly or implicitly after technology use. Using service quality measures, Jiang et al. (2012) found that expectations were positively related to perceptions.

As supported by the EDT and the D&M ISS model (Oliver, 1980; DeLone & McLean, 1992), this study proposed the following hypotheses:

- Hypothesis 1a: Information quality expectation is positively related to perception.
- Hypothesis 1b: Service quality expectation is positively related to perception.
- Hypothesis 1c: System quality expectation is positively related to perception.
- Hypothesis 1d: Learning quality expectation is positively related to perception.

2.4 Expectation and Disconfirmation (Hypothesis 2)

Many recent satisfaction research studies do not delineate or delimit expectations and disconfirmation constructs as Oliver (1980) initially presented in his research. Oliver (1980) stated that the desire or expectation effects and the actual experience may be additive as they result in the disconfirmation measure. Many terms and constructs have existed in the literature to present expectations that users, customers, and learners may hold. Although recent studies

have used models that present the confirmation-only construct (Bhattacherjee, 2001), this present study provided a more comprehensive view of perception formation by including the disconfirmation construct. A reason for doing so was to best capture whether there was a positive or negative effect based on whether perceived performance exceeds or fails to meet initial expectations, as suggested by Oliver (1980). The inclusion of this variable aimed to clarify if there was merit for measuring learner expectations instead of solely measuring perception and/or disconfirmation; additionally, it may have helped explain previous mixed results (Churchill & Suprenant, 1982).

Positive disconfirmation, or confirmation, resulted when users' perception of performance exceeded their original expectations (Hsieh et al., 2010; Oliver, 1980). Perceived usefulness, beliefs, and attitudes in the literature has tried to determine and predict disconfirmation. In CPD eLearning, users may have begun with the notion that the content was exactly what they needed at the time. Their expectations might have included a speedy course delivery and an issue-free system experience. They may also have expected to receive quick customer service and an easy registration process. If any of these expectations are not met, and thereby produced a negative experience, negative disconfirmation resulted. Some studies have found it useful to develop the disconfirmation measure as one group of general statements, and others have developed groups of statements around certain constructs. For example, Lankton and McKnight (2012) had the usefulness disconfirmation and the ease-of-use disconfirmation measures. Likewise, Hsieh et al. (2010) used an information quality disconfirmation and a system quality disconfirmation set of measures. In these studies, the expectation, perception, and disconfirmation measures were the same (Lankton & McKnight, 2012; Hsieh et al., 2010).

Mixed findings might have led to the belief that more research was needed to better understand the link between expectations and disconfirmation (Bhattacherjee & Premkumar, 2004). Venkatesh et al. (2011) found a negative relationship between pre-usage beliefs and disconfirmation. As learners are completing CPD eLearning, they are evaluating their initial expectations. Premkumar and Bhattacherjee (2008) tested the relationship of expectation and positive disconfirmation within their model. They posited that they would find a negative relationship. Although their results were insignificant, a slight negative relationship existed. The research discussed how limited exposure to the technology may have contributed to the measures. Lankton et al. (2014) measured the relationship between technology-trusting expectations and technology-trusting disconfirmation. They did not find a significant influence on what they were tested.

Quality is an important factor in CPD eLearning satisfaction, continuance, and success. Since only a few recent studies have looked at the specific relationship between quality expectation and disconfirmation (McKinney et al., 2002), this offered an area for exploration and integration. Hence, this study proposed the following hypotheses:

- Hypothesis 2a: Information quality expectation is negatively related to disconfirmation.
- Hypothesis 2b: Service quality expectation is negatively related to disconfirmation.
- Hypothesis 2c: System quality expectation is negatively related to disconfirmation.
- Hypothesis 2d: Learning quality expectation is negatively related to disconfirmation.

2.5 Perception and Disconfirmation (Hypothesis 3)

As stated earlier, previous studies have often failed to consider the full disconfirmation continuum (Oliver, 1980). Moreover, the literature has often erroneously interchanged the

confirmation construct (positive disconfirmation) with disconfirmation. For example, Chiu et al. (2005) used the measures of usability, quality, and value for the perception and disconfirmation constructs; they found strong effects among those measures.

This study labeled the construct as disconfirmation, but it was really measuring confirmation since it used the affirmative phrasing, Was Better Than Expected, in the statement. Learners were asked to use a 7-point Likert-type scale to indicate their level of agreement where 1 was Strongly Disagree and 7 was Strongly Agree. Whereas with disconfirmation statements, learners usually responded to statements that ranged from Much Worse Than Expected to Much Better Than Expected. Hsu, Yu, et al. (2014) also used the confirmation construct with three statements that asked about experience with the technology, the level of service provided, and overall expectations. However, because disconfirmation and confirmation are used interchangeably, we surmised that a relationship existed for further future exploration. Statement wording and how participants are asked to respond was sure to affect this relationship.

Mixed results found in previous studies like Chiu et al. (2005) offered an opportunity for further investigation and additions to the body of research. McKinney et al. (2002) investigated the links between both perceived performance of information quality and information quality disconfirmation as well as perceived performance of system quality and system quality disconfirmation. A few other researchers have not found this relationship to be very significant (Bhattacherjee & Premkumar, 2004; Premkumar & Bhattacherjee, 2008; Chiu et al., 2005; Lankton et al., 2014). However, Roca et al. (2006) found a very strong relationship between quality perception and confirmation (positive disconfirmation). Within a service quality-focused study, Lin, Tsai, & Chiu (2009) found a positive relationship. This study aimed to correct for this error by selectively delineating the confirmation and disconfirmation constructs with hopes of

elucidating the expected relationships between quality perceptions and disconfirmation. Hence, this study proposed the following hypotheses:

- Hypothesis 3a: Information quality perception is positively related to disconfirmation.
- Hypothesis 3b: Service quality perception is positively related to disconfirmation.
- Hypothesis 3c: System quality perception is positively related to disconfirmation.

2.6 Expectation and Satisfaction (Hypothesis 4)

Expectations had set the users' probability of occurrence and then expectations allowed them to evaluate their actual experiences against their desired experiences (Oliver, 1981). Satisfaction was the emotional result of an experience with a product or service (Oliver, 1980; Spreng et al., 1996). Recent studies have found that eLearning information, system, and service quality have a strong positive correlation with user satisfaction (Roca et al., 2006; Wong & Huang, 2011). Many of these studies focused on the perception of performance, and they suggested additional research was necessary to include the expectation levels of quality (Roca et al., 2006). While all quality levels are important, information quality has shown to be critical in eLearning satisfaction (Roca et al. 2006). This has led to the belief that users have greater satisfaction if eLearning content is clear, understandable, and relevant. Expectation has been shown to be important in explaining satisfaction (Lankton & McKnight, 2012).

Several studies have concluded that a relationship exists between expectation and satisfaction. As an example, Kim, Ferrin, & Rao (2009) found a positive correlation between expectation and satisfaction in the online shopping context. Using only service quality measures, several researchers found a positive relationship between satisfaction and expectations within contexts of consumers in a salon (Lin, Tsai, & Chiu, 2009) and in technology (Jiang et al., 2012). However, Lankton et al. (2014) found no significant influence from technology-trusting

expectations on satisfaction with the specific technology application, Microsoft Access. Bhattacherjee and Premkumar (2004) supported their hypothesis of expectation having a positive effect on satisfaction with the learning experience. By using a scale that included both intensity and valence (positive and negative), studies validated the measure of overall satisfaction (Spreng et al., 1996). To illustrate this, Bhattacherjee and Premkumar (2004) presented a study done in a CPD eLearning-related context and measured satisfaction on how extremely displeased or pleased, extremely frustrated or contented, extremely terrible or delighted, and extremely dissatisfied or satisfied learners were with their use of the learning technology.

To conclude this section, the literature has shown great support for the positive relationship between expectation and satisfaction of the learning experience. This study was interested in learning about expectations of learning quality, which has included service quality, system quality, and information quality, and its effect on satisfaction with the learning experience. Hence, this study proposed the following hypotheses:

- Hypothesis 4a: Information quality expectation is positively related to satisfaction with the learning experience.
- Hypothesis 4b: Service quality expectation is positively related to satisfaction with the learning experience.
- Hypothesis 4c: System quality expectation is positively related to satisfaction with the learning experience.
- Hypothesis 4d: Learning quality expectation is positively related to satisfaction with the learning experience.

2.7 Perception and Satisfaction (Hypothesis 5)

Perception of performance has also been found to be an important indicator of satisfaction (Lankton & McKnight, 2012). Numerous studies have supported that the perception of quality was a very strong predictor of satisfaction with the learning experience (Lin, 2007). System and information quality were other very strong predictors (Chen, 2010; Chen, & Kao, 2012; Eom et al., 2012; Roca et al., 2006). Service quality perception was another predictor that was significantly and positively related to satisfaction (Chiu et al., 2005; Jiang et al., 2012; Premkumar & Bhattacherjee, 2008; Roca et al., 2006). Marjanovic, Delić, & Lalic (2016) found support for the positive link between the perception of system quality and satisfaction in the eLearning context. Focused on eLearning quality, Udo et al. (2011) found positive relationships in constructs related to satisfaction and information, service, and system quality. Also focused on CPD eLearning, Mohammadi (2015) investigated the association among satisfaction and educational quality, service quality, technical system quality, and content and information quality. Technical system quality had the greatest positive effect on satisfaction, while service quality, information quality, and educational quality also had positive effects (Mohammadi, 2015). Lin (2007) also found support for the perception of system quality, information quality, and service quality having had a positive effect on satisfaction. Hence, this study proposed the following hypotheses:

- Hypothesis 5a: Information quality perception is positively related to satisfaction with the learning experience.
- Hypothesis 5b: Service quality perception is positively related to satisfaction with the learning experience.

- Hypothesis 5c: System quality perception is positively related to satisfaction with the learning experience.
- Hypothesis 5d: Learning quality perception is positively related to satisfaction with the learning experience.

2.8 Disconfirmation and Satisfaction (Hypothesis 6)

While perception of performance has been shown to important to satisfaction with the learning experience, disconfirmation has also been positively related to satisfaction (Bhattacherjee & Premkumar, 2004; Hsu, Yen, Chiu, & Chang, 2006; Premkumar & Bhatacherjee, 2008; Roca et al., 2006). Although quality disconfirmation and value disconfirmation were not significant, Chiu et al. (2005) only partially supported disconfirmation (usability disconfirmation) as a significant determinant of satisfaction. Hsu et al. (2006) found supporting evidence that disconfirmation and satisfaction were positively related in the context of online shopping. Pereira et al. (2015) investigated the relationship among satisfaction and quality disconfirmation, usability disconfirmation, and value disconfirmation in a virtual learning environment. A positive relationship was found between value disconfirmation and satisfaction, but no significant relationship was found for the others. In contrast, Lankton et al. (2014) did find that disconfirmation influences satisfaction significantly. Through their study of positive disconfirmation on satisfaction, Lin, Tsai, and Chiu (2009) did find a significant association between the two with expectation measures focusing on service quality. Hence, this study proposed the following hypothesis:

- Hypothesis 6: Disconfirmation is positively related to satisfaction with the learning experience.

2.9 Satisfaction and Continuance Intention (Hypothesis 7)

EDT, in combination with the D&M ISS model or TAM, has often been used for research related to continuance (Lin, 2011). As the research has shown, those who completed training experienced higher levels of satisfaction than those did not (Levy, 2007). Researchers have described how eLearners are searching for quality and satisfaction, just as consumers are (Chen et al., 2008; Lin, 2011).

Overall, satisfaction has been found to be a key driver in continuance (Bhattacherjee, 2001; Chiu et al., 2005; Hsu, Chang, Chu, & Lee, 2014; Roca et al., 2006; Mohammadi, 2015; Udo et al., 2011). Continuance intention and continuance behavior are important constructs to investigate. If users discontinue their use of eLearning, there may be no return on investment from that particular learning experience (Davis, Bagozzi, & Warshaw, 1989). The TAM and D&M ISS model research has placed great emphasis on continuance intention and actual usage. Satisfaction is also the focus in the D&M ISS model research. Citations credit EDT as helping to explain satisfaction and continuance intention (Hossain & Quaddus, 2012). Measuring continuance intention would allow organizations to determine if eLearning is well designed and being properly implemented.

Studies have shown that many learners already tend to have computer anxiety and self-efficacy issues (Taipjutorus, Hansen, & Brown, 2012) so additional technical issues will not help the adoption and completion rates (Sitzmann, Ely, Bell, & Bauer, 2010). The Lin (2011) study presented the negative critical incidents factor that may affect satisfaction when things do not go as they should. Chen et al. (2008) classified negative critical incidents into four main areas: administrative procedures, system functionality, the instructional process, and learner interactions. Those factors at the top of the list, which influenced dropouts, include lack of

motivation, issues with instructional design and learning style, and time conflicts (O'Connor et al., 2003).

As this study aimed to test, several studies have sampled adult learners in CPD eLearning programs and have presented evidence that validated a positive relationship between satisfaction with the learning experience and continuance intention (Chiu et al., 2005; Lee, 2010; Lin, 2007; Roca et al., 2006). In measuring the decision to use, experience, and perform CPD eLearning, Chiu et al. (2005) found a strong positive relationship to the intention to continue using CPD eLearning in the future. In addition, Lee (2010) also provided a measure on whether CPD eLearners would recommend eLearning to others. Roca et al. (2006) tested a model that also included how the perception of CPD eLearning quality affects satisfaction. Their model validated that satisfaction had a positive relationship with continuance intention (Roca et al. 2006). Hence, this study proposed the following hypothesis:

- Hypothesis 7: Satisfaction is positively related to continuance intention.

2.10 Satisfaction and Continuance Behavior (Hypothesis 8)

Many studies go beyond the continuance intention construct by measuring the actual use or the continuance behavior construct. Although discontinuation has occurred for many reasons, such as low perceived level of usefulness, low perceived value of what was being learned, or low satisfaction (Chiu et al., 2007), there has existed a great threat that CPD eLearners who do not complete the courses or program may cause CPD eLearning to be considered irrelevant (Long, Dubois, & Faley, 2009; Welsh, Wanberg, Brown, Simmering, 2003). However, Macdonald, Bullen, & Kozak (2010) listed more specific success factors, including job-related course content as well as technical and infrastructure support. Learners who were satisfied with the learning experience, service, and relevance of CPD eLearning were expected to have a greater chance of seeing the program through to completion.

A couple of studies took a similar investigative approach—they sampled adult learners in CPD eLearning programs and presented evidence that validated a positive relationship between satisfaction with the learning experience and continuance behavior (Lin, 2007; Mohammadi, 2015). Through a model that included quality measures, satisfaction was found to be positively related to continuance behavior (Lin, 2007). Mohammadi (2015) measured continuance behavior by asking daily questions related to using CPD eLearning. These studies found that satisfaction has a positive effect on continuance behavior of CPD eLearning. Hence, this study proposed the following hypothesis:

- Hypothesis 8: Satisfaction is positively related to continuance behavior.

2.11 Continuance Intention and Continuance Behavior (Hypothesis 9)

Continuance intention and continuance behavior are worthy of further investigation. Continuance intention is rooted in the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) where intention has been the best predictor of behavior (Bhattacherjee et al., 2008). TRA has posited that such constructs as subjective norms and others' perceptions of the behavior affect the outcome (Fishbein, 1967). TPB extended TRA by incorporating the possibility of constraints that learners have faced when their intentions were to behave in a particular manner (Ajzen, 1985). If behavior has been the ultimate goal, intention has been a good place to start, although continuance behavior warrants further exploration.

Quite a few studies have supported continuance intention having a significant relationship with actual continuance behavior (Bhattacherjee et al., 2008; Lin, 2007; Mohammadi, 2015). Because the ultimate goal has been to predict behavior, continuance intention alone may not suffice in a theoretical model (Bhattacherjee et al., 2008). Both the D&M ISS model as well as the TAM have often highlighted intention as playing a critical role in continuance behavior (Davis, 1989; DeLone & McLean, 1992, 2003). As it related to

technology, Bhattacherjee et al. (2008) measured continuance intention as well as the number of times the system was accessed weekly and the number of applications used in the system to represent continuance behavior.

Additional CPD eLearning-related studies have found a positive relationship between continuance intention and continuance behavior. Lin (2007) analyzed the relationship between continuance intention and continuance behavior in a CPD eLearning-related setting. This study found that this relationship was significantly positive for these two constructs (Lin, 2007). Based on the D&M ISS model (DeLone & McLean, 2003), Mohammadi (2015) measured continuance behavior by collecting responses regarding the frequency with which CPD eLearners used or visited a CPD eLearning system. Hence, this study proposed the following hypothesis:

- Hypothesis 9: Continuance intention is positively related to continuance behavior.

2.12 Motivation to Learn in Adults

The term *learning* has differed a bit from the term *education* because its focus has been on the individuals who were expecting a change in behavior, knowledge, skills, or attitude to occur within them (Knowles, Holton, & Swanson, 2005). Learning, as defined by Houle (1980), has been the process by which people gain knowledge, sensitiveness, or mastery of skills through experience or study. The desire to learn and to continue learning has come from within (MacKeracher, 2004; Ryan & Deci, 2000). Therefore, not much motivation, encouragement, or pressure has been needed from external rewards or punishments (Deci, Koestner, & Ryan, 1999; MacKeracher, 2004). Facilitators and learning activities should have ensured, however, that no demotivators were present in the learning environment (Deci et al., 1999; MacKeracher, 2004).

Motivation has been the degree of energy directed towards accomplishing a goal (Wlodkowski, 2008). It has aided understanding of learners' purpose, expectations, and perceptions. It has been shown to be very substantial to know the reason or motivation behind

adult learners' motivation to learn (Knowles, Holton, & Swanson, 2005; Wlodkowski, 2008). In turn, this has better informed those involved in supporting adult learning on how to help adults learn, give them direction, sustain learning, and complete learning (Wlodkowski, 2008).

The literature has shown that measuring motivation—whether extrinsic or intrinsic—was also important. While andragogy assumptions have posited intrinsic motivation as being more powerful than extrinsic (Knowles, Holton, & Swanson, 2005), the literature has shown that other motivating factors may have affected learners' decisions to participate in and complete learning and training programs. While adults may have responded to extrinsic motivators such as better jobs, promotions, and higher salaries, intrinsic motivators such as self-esteem and satisfaction have seemed to be the most powerful motivators (Knowles, Holton, & Swanson, 2005). In Wetta-Hall et al. (2006), nurses completed CPD related to terrorism response and emerging infections because they were motivated by the contributing credits toward their licensure.

Jun (2004, 2005) stressed the importance of studying and analyzing multiple variables that may have contributed to adult learners dropping out of eLearning courses. Predictors such as education level, hours worked per week, and mandatory versus voluntary attendance were analyzed as well as motivational variables that dealt with attention, relevance, confidence, and satisfaction (Jun, 2004). Although eLearners may have been able to learn more when their motivation before training was high, this did not lessen the negative effects that technical difficulties may have had on learning (Sitzmann, Ely, Bell, & Bauer, 2010). Sitzmann et al. (2010) suggested that learning research must include attrition data to avoid the threat of internal validity (Cook & Campbell, 1979). Sitzmann et al. (2010) also found an interaction effect between pre-training motivation and technical difficulties. They found motivation to be

important in determining how learners react to external stimuli, thus predicting attrition (Sitzmann et al., 2010).

Some studies have looked at the TAM and the Unified Theory of Acceptance and Use of Technology (UTAUT) with motivation as a moderator construct, but this researcher found a void of studies in relation to eLearning with the EDT model. This present study focused on the basics of motivation whether it was intrinsic or extrinsic. Some studies have portrayed the motivation construct through the perceived usefulness (extrinsic) and perceived enjoyment (extrinsic) dimensions (Teo, Lim, & Lai, 1999). Research supports that these motivations have a significant effect on the continuance intention of users (Saade, Nebebe, & Mak, 2009; Teo, Lim, & Lai, 1999). Saade, Nebebe, & Mak (2009) also found that intrinsic motivation had a significant direct effect on perceived ease of use and perceived usefulness, whereas it was insignificant for behavior intention.

Many researchers have supported the idea that intrinsic and extrinsic motivation have been important in IT acceptance and adoption (Davis, Bagozzi, & Warshaw, 1992; Venkatesh, 1999; Yoo, Han, & Huang, 2012). They have described intrinsic motivation as the natural tendency for people to want to learn and be a part of something. Extrinsic motivation has had many definitions based on the people and the context. Studies have also emphasized the importance of intrinsic and extrinsic motivation in technology acceptance for employers to establish strategies in promoting eLearning (Lee, Cheung, & Chen, 2005; Yoo et al., 2012). There was support in this study for the need to look at the effect that motivation, primarily intrinsic, has had on continuance intention as well as continuance behavior (Yoo et al.,2012). However, that study used the UTAUT model, and this current research explored the constructs based on an extended model of EDT.

Yoo et al. (2012) published a study based in South Korea that examined the effects of both intrinsic and extrinsic motivators on eLearning acceptance at a mid-size food service company. The Yoo et al. (2012) study used the UTAUT to guide its data collection by using questions in the performance expectancy, effort expectancy, attitude, social influence, facilitating condition, anxiety, and the intention to use eLearning categories. That quantitative study found that intrinsic motivators were more effective than extrinsic motivators were.

Studies found that personal motivation was the most important factor to affect completion (O'Connor et al., 2003). Also high on the list of factors were the learning interactions and mandatory completion policies (O'Connor et al., 2003). Holocher, Kieslinger, and Fabian (2010) discussed motivational barriers when information systems were introduced for collaborative workplace learning purposes. Intrinsic motivational drivers and barriers included enjoyment in helping others, knowledge growth, and increased performance. Extrinsic motivational drivers and barriers included reputation, reciprocity, and organizational reward. Rewards based on task performance worked negatively towards intrinsic motivation. They proposed that through Self-Determination Theory (SDT) relative autonomy varied in extrinsic motivation (O'Connor et al., 2003).

It has made sense that offering rewards would decrease intrinsic motivation since there was only one source of motivation. In other words, adding extrinsic motivation has required the subtraction of some intrinsic motivation since the drive to do, complete, or learn has come from the same place. Learners' focus was not on their own personal internal gain; rather, their focus was on the prize or the reward. Like a continuum, the locus of causality changed. Learners might have completed a course because they wanted a certificate to move up later in their career or because it was required by their current supervisor. Both of these reasons have varying levels

of autonomy and are considered extrinsic motivation. The Wetta-Hall et al. (2006) study comes to mind again. In their focus group sessions, nurses completed continuing education related to terrorism response and emerging infections, and their primary motivation was the continuing education credits they earned toward their licensure.

Learners who enter into third-party eLearning systems, such as the learning management system in this study, must have a definite sense of self-directedness. The content that has been presented in this study has very much to do with a work-related need, whether professional or volunteer, for learning. The motivation, if it falls into line with the assumptions, seems as if learners want to do this for intrinsic, or internal, motivations rather than extrinsic, or external, motivations. Adult learners would expect to be able to quickly apply the content they learned to some relevant activity or situation in their role.

"Attrition, retention, and student persistence are complex issues that are difficult to study . . ." (Hagedorn, 2005).

2.13 Motivation and Continuance Intention and Behavior (Hypotheses 10 and 11)

Motivation to learn comes in various formats and can be classified as either intrinsic or extrinsic (Deci & Ryan, 1985). Studies have supported that these motivations have been important in technology acceptance, adoption, and behavioral intention. Internal factors may have provided the source of motivation for eLearning participation. These motivators may have included doing things because they bring enjoyment, because they are good, or because they are the right things to do. Some findings have supported that intrinsic motivation is stronger than extrinsic motivation (Hsu, Yu, et al., 2014; Yoo et al., 2012).

Many studies have introduced the concept of motivation in learning using varied labels and measures. Value has often been used in the literature to describe motivation of why learners would participate in CPD eLearning and, ultimately, what they would get out of it (Pereira et al.,

2015). Examples of things that learners might value have included a sense of accomplishment, a feeling of pleasure, a feeling of intelligence, and a sense of independence. Pool, Poell, Berings, and ten Cate (2016) explored the relationship between nurses and their motives for participating in CPD. After an extensive literature review, they found that the most cited motives were "to increase competence in present job," "to comply with requirements," "to deepen knowledge," and "to enhance career development" (Pool et al., 2016). Yoo et al. (2012) combined performance expectancy, social influence, and facilitating conditions to represent extrinsic motivation. Effort expectancy, anxiety, and attitude have all been represented as intrinsic motivation. Teo et al. (1999) used perceived ease of use as the extrinsic motivation and perceived enjoyment as intrinsic motivation.

Many studies have used specific measures for various constructs that help to define why learners participate in CPD eLearning. Lin (2007) does not label it separately, but the continuance intention and continuance behavior constructs each have defined measures that can be categorized as intrinsic or extrinsic motivators. For instance, "I believe it is worthwhile for me to use…" is considered intrinsic. While, "I use…to increase my chances of obtaining rewards" is considered extrinsic.

Several studies have provided useful findings, and these findings have suggested that additional investigation on how intrinsic motivation effects satisfaction with continuance intention and continuance behavior would be beneficial. Chiu et al. (2007) examined the relationships among attainment value, intrinsic value, and utility value with satisfaction as well among attainment value, intrinsic value, and utility value with continuance intention in the CPD eLearning context. All of these relationships have supported the existence of significantly positive relationships. Sorebo et al. (2009) also found a significant relationship between intrinsic

motivation with satisfaction and continuance intention in the CPD eLearning context. Most research hypotheses have focused on the relationship between two variables at a time. Since intrinsic motivation has positively affected satisfaction and continuance intention, the present research wanted to extend this analysis. Hence, this study proposed the following hypotheses:

- Hypothesis 10: Intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship between satisfaction and continuance intention. The moderation effect is positive when there is congruence between intrinsic motivation and satisfaction, such that high satisfaction is positively associated with continuance intention in a strong, intrinsic motivation context and low satisfaction is positively associated with continuance intention in a weak, intrinsic motivation context.
- Hypothesis 11: Intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship between satisfaction and continuance behavior. The moderation effect is positive when there is congruence between intrinsic motivation and satisfaction, such that high satisfaction is positively associated with continuance behavior in a strong, intrinsic motivation context and low satisfaction is positively associated with continuance behavior in a weak, intrinsic motivation context.

CHAPTER 3. RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter provides a detailed account of the research effort. The following section describes the details of the research methodology used in this study, including information on the research setting, design, analysis, and research appropriateness; the participants and testing/survey procedures; instrumentation development and data collection; analytic strategy; and, ethical considerations and study approval.

3.2 Problem and Purpose Overview

The primary purpose of this correlational quantitative study was to investigate factors that may account for CPD eLearning participation and completion. This study examined first responders enrolled in CPD eLearning to advance understanding of the relationships among expectations of quality, perceptions of quality, disconfirmation, and satisfaction. This investigation also explored whether learner motivation moderated the relationship between satisfaction and continuance intention or satisfaction and actual continuance behavior. The purpose of this quantitative study was achieved by conducting a survey that applied a more holistic approach in EDT-based understanding of eLearning. The researcher collected data first responders registered in CPD eLearning between May 2014 and October 2014.

While many studies have looked at the acceptance and success of eLearning, this study sought to add to the body of literature by focusing on the first responders' reported level of satisfaction with the program and process, their continuance intention, and their reported level of actual continuance. The intent of this study was to examine and explore factors affecting satisfaction that predict continuance in CPD eLearning. While applying this marketing-based theory in the area of CPD eLearning, this study also examined the effects of the participants' motivation as a moderating variable.

3.3 Research Setting

The setting for this study was CPD eLearning developed by an organization housed on a university campus and with federal funds. The researcher was previously employed by the organization that managed the program and process. Although most programs run through a university are academically-related and funded by the university, some are funded by external sources. However, the university has a centralized process that maintains general oversight and management of the program and funding. The program of focus in this study provided courses in both instructor-led and web-based formats and aimed to help prepare America for various types of threats and hazards, primarily in the areas of biological, food, agriculture, and law enforcement.

For this study, the researcher focused on eLearning courses offered online and based in Adobe Flash. Adobe Flash is an application that allows for the development of rich, interactive content and animation. These courses were asynchronous since learners and instructors never convened at the same time to communicate online. The pre-recorded course was the same for everyone regardless of when they accessed the course.

Even though the courses are offered at no cost, this CPD eLearning was comparable to the role of a vendor/product with the learners as the consumers. Individuals signed up to take CPD eLearning; they did not need prior approval to register or complete these courses. A learning management system (LMS) enabled learners to complete a registration form and log in upon receipt of their unique credentials. Upon log in, the learners chose, started, and completed as many courses as they desired. The system allowed all learners to access any courses without imposed time limits for completion.

The LMS in this study had been live since February 2009, while the CPD eLearning program had existed since 2007. The CPD eLearning in the LMS was either inherited or created with the assistance of an outside vendor.

This study focused on adults engaged in CPD eLearning that contributed to adult learners' knowledge, skills, and abilities in the area of first response. The total registered learner count in the system as of December 2014 was 32,375 learners.

CPD can be formal from an educational institution, nonformal through associations or other organizations, and informal through life experiences (Collin et al., 2012; Lowenthal, Wilson, & Parrish, 2009; Merriam, Caffarella, & Baumgartner, 2007). eLearning in this study focused on nonformal CPD in an asynchronous delivery format. When learners enrolled in CPD eLearning, they self-registered into an online system that offered several opportunities for learning. Each enrolled registrant was considered a unique learner in that system. eLearning offered in an asynchronous format allowed individual learners to access the content at their convenience. No real-time learner and instructor interaction was necessary.

3.4 Research Design and Analysis

A correlational design has generally involved an instrument that measures certain variables and allows numbered data to be analyzed using statistical procedures (Creswell, 2013). Using a correlational design, the researcher was able to determine whether relationships existed between variables in the study as well as the strength of those relationships. A nonexperimental approach was used in this study since the population was already registered into the particular LMS. This field study set out to collect cross-sectional data from a single collection point and from a sample of learners that registered for CPD eLearning. The research setting was considered a non-contrived setting since the researcher did not control or modify the environment. The learners self-selected themselves into particular courses, which further

supported the researcher's choice to use the existing situation as is found in the field of study (Holton & Burnett, 2005).

A purposive sample of learners was selected based on a list of those that registered in the system in the six months before the initial date of data collection. The researcher selected this period because of the high rate of turnover and latency issues that could have occurred with a sample collected from those learners who registered more than six months before. Based on historical data from the LMS, most learners in this program completed courses within 1–3 months of system registration. Because many learners may enroll in several different courses and they may do so at different times, the researcher based the selection date on when the learners first registered into the system. Table 1 shows the data related to the LMS courses used in this study.

Table 1. CPD eLearning Course Completion Totals Over 5 Years

Course	Total Enrolled	Not Completed	Completions	Completion Percentage
CPD eLearning Course #1	29,617	29,459	158	1%
CPD eLearning Course #2	28,066	26,930	1,136	4%
CPD eLearning Course #3	28,010	27,464	546	2%
CPD eLearning Course #4	29,544	28,958	586	2%
CPD eLearning Course #5	29,537	28,848	689	2%
CPD eLearning Course #6	29,538	28,977	561	2%
CPD eLearning Course #7	29,537	28,150	1,387	5%
CPD eLearning Course #8	26,630	25,169	1,461	5%
CPD eLearning Course #9	26,688	26,179	509	2%
CPD eLearning Course #10	29,542	28,657	885	3%
CPD eLearning Course #11	26,638	23,685	2,953	11%
CPD eLearning Course #12	28,005	25,939	2,066	7%
CPD eLearning Course #13	23,246	15,343	7,903	34%
Total Completions			20,840	

Although the researcher limited the sample frame to a specified set of dates, no evidence was found to believe that this sample would not represent the general makeup of all those learners who have previously registered in this eLearning program.

Data collection began in February 2015. Thus, the latest registration date was 3 months before that date, and the earliest registration date could not be earlier than 6 months before that date.

The researcher reviewed and compared the demographic data against that which was collected in this eLearning program. First responders tended to complete much training over their tenure, and they experienced a high rate of turnover. Therefore, the registration date parameter for inclusion in this study was set to a time period of 6 months.

The expected response rate for this study's model usually fell in the range of 30% to 60%. To increase *n*, or the response rate for this study, the researcher focused on techniques that could further assist in better statistical power, reduce sampling error, and provide greater validity to the results. The researcher shared information with the participants about the overall benefits of this study. Participation was assured to be voluntary and confidential. The researcher publicized the incentive opportunities. Potential study participants also received weekly friendly reminders via email to encourage responses on weeks 1, 2, 3, and 4. After generating the list of registered learners, the researcher compiled physical addresses and created postcard labels. The postcard was sent out via the postal service 1 week before the email announcement. Learners also received personal emails notifying them of the study, eliciting their voluntary participation, and providing a link to the survey.

The researcher administered an online survey to the sample group using the LSU Qualtrics system. This system collected demographic information and responses related to

selected constructs of focus for this study. The researcher based the survey questions on previous research and instruments used in related studies with the questions adapted for the context of this study. Once collected, the researcher calculated the level of correlation between the variables and performed a factor analysis.

In the instrument, the researcher was first interested in using an online survey to find out learner expectations about quality before the learners entered the program. Then, the learners were asked their perception of whether the CPD eLearning met their expectations. The researcher then analyzed the learners' level of disconfirmation based on the data collected in that section of the survey.

Survey questions also queried the level of participants' intrinsic and extrinsic motivation. A measure was collected on which courses and how much training the participants thought they would complete when they initially registered. In addition, participants were asked to report how many courses they had taken and completed. The researcher also explored using an additional measure to assess possible common method bias.

3.5 Research Appropriateness

Due to the lack of empirically based research studies in the combined area of CPD, eLearning, and evaluation, the researcher chose a survey research design as the data collection method. It is the most frequently non-experimental quantitative method used for theory testing. This self-generated, primary source of data provided a look at variable relationships in a particular context. The focus went beyond just descriptive measure in the study and looked further into the relationship of variables (Punch, 2003), or correlational research. Based on the literature and the specific models reviewed in relation to this topic, the researcher chose to measure certain variables to determine what, if any, trends and relationships were present in the quantitative data (Cresswell & Plano Clark, 2011). This allowed for analysis of certain data

constructs to determine if any significant relationships existed. The researcher analyzed the data statistically through multivariate correlational research techniques.

An online survey design allowed reach to more learners in a shorter amount of time. Ary et al. (2006) discussed the advantages of email and internet surveys that included prompter returns and lower item nonresponse (Dillman, 2000). The researcher obtained email addresses from the registered learner list in the eLearning LMS in order to send out the link to the survey. The learners provided their email addresses to gain access to the eLearning courses. The researcher deemed this information to be a reliable contact method for these learners. Response rates were not necessarily better in the online survey design format (Dillman, 2009). However, less money was spent on administration, and less time was spent in organizing large samples and data (Dillman, 2000).

3.6 Participants and Procedures

Through the Department of Homeland Security (DHS) and Federal Emergency Management Agency (FEMA), the National Training and Education Division (NTED) has been training first responders. Although they did not explicitly identified themselves as first responders, these learners were part of the federal, state, local, and/or tribal jurisdictions' categories that needed all-hazards training based on FEMA guidance and approved by DHS.

The researcher accomplished the purpose of this study by surveying registered CPD eLearners that were participating in online programs. The demographics information collected included information about their professional discipline based on the listing found on the NTED website (n.d.). Participants self-identified in these disciplines which included Emergency Management, Emergency Medical Services, Fire Service, Governmental Administrative, Hazardous Materials Personnel, Healthcare, Law Enforcement, Public Health, Public Safety Communications, and Public Works (NTED, n.d.). The researcher did not exclude any

participants based on their responses to this demographic question. The CPD eLearners represented locations all across the United States. The target population for this study was learners enrolled in CPD eLearning and who registered in an LMS to take first responder-related online courses offered in an asynchronous format. Sample size determination is an important step in this research study that is discussed later on in the Analytic Strategy section.

After the researcher reviewed prior years' registration and completion data, it was determined that most CPD eLearners complete a course within 1–3 months after their registration date. The nonrandom, purposeful sample was limited to those learners who registered in CPD eLearning between May 2014 and October 2014, which yielded a sample size of 1,267 learners. The researcher sent a postcard and several emails to the cross-sectional sample inviting them to participate in the study. Several hundred postcards were returned due to incorrect postal addresses and 27 emails bounced back in the LSU Qualtrics system.

Many organizations that have delivered CPD eLearning courses often measure learner satisfaction and program success based on the number of learners that complete a course (Chiu, Hsu, Sun, Lin, & Sun, 2005; Levy, 2007). More recent studies have been showing that workplace eLearning is often evaluated based on this method (Wang, Ran, Liao & Yang, 2010). The initial level has measured the learners' reactions or satisfaction with the training at completion. Bhattacherjee (2001) defined *continuance* as continued use, which can be measured as intention or the actual behavior.

Of the 302 surveys that were started, the researcher was able to consider only 217 as useable. The researcher decided to eliminate surveys with incomplete responses for statistical analyses in order to avoid confounding variables (more than 10% of missing responses) (Hair et al., 2010). Twenty-five respondents clicked to open the survey, but they failed to even answer

the question for consent. Five respondents refused to grant consent to participate in the study. Therefore, the response rate for this study was 23.8% for started surveys, but the researcher considered only 17.1% to be complete and useable surveys. Of the 217 participants, which represented 38 of 50 states in the United States, the majority (82.5%) identified as male, 29.5% were in the 41–50 age range, 47% were in law enforcement, 26.3% had been in their profession for 1–5 years, 55.8% reported taking more than five online courses before this CPD eLearning, and almost half had either a 2-year associate's degree or a high school diploma as their highest level of education.

3.7 Data Collection

Several key pieces of research provided helpful guidance in formulating this study's instrumentation. The researcher adapted the measurement items from existing literature wherever possible. Due to the high factor loadings and reliability in studies such as Lin (2007), Premkumar and Bhattacherjee (2008), and DeLone and McLean (1992), the researcher based the data collection instrument on the following description. The researcher performed pilot testing using a small population sample and a subject matter expert (SME) review of the data collection instrument to ensure the appropriate constructs were measured for this specific setting and sample. The appropriate informed consent verbiage and process was submitted for approval to abide by ethical guidelines for the well-being of the participants.

3.8 Instrumentation Development

Satisfaction surveys in both the business and education worlds have provided service providers with opportunities to receive feedback and evaluation from those who have purchased their goods or services. The researcher created and patterned the eLearning Satisfaction and Success (eLSS) survey after the study's conceptual theories and framework. Therefore, the majority of items came from previous scales in the research and were modified to fit this study's

topic, context, and audience. Based on the research, this survey had seven subscales: Quality Expectation (information quality expectation, service quality expectation, and system quality expectation), Quality Perception (information quality perception, service quality perception, and system quality perception), Disconfirmation, Satisfaction, Motivation, Continuance Intention, and Continuance Behavior. The researcher used a Likert-type scale for the survey questions except for the continuance intention and behavior questions that asked about course completion.

This instrument also provided the researcher with a means for collecting demographics, including data such as age, primary professional discipline, current work location, length of time in current position, length of time in the profession, history of previous eLearning courses, gender, and highest level of education.

The researcher administered this online survey to all the selected study participants. The researcher chose to create and disseminate the surveys through Qualtrics because it was available to all LSU departments. The LMS sent emails directly from the Qualtrics system and tracked whether emails were undeliverable due to inaccurate addresses.

3.8.1 Review by Subject Matter Experts

Fourteen SMEs reviewed the instrument before the researcher piloted the questions or administered the tool to any of the participants. This review helped investigate the validity and reliability of the instrument since some questions were modified to fit this particular context. Rubio, Berg-Weger, Tebb, Lee, and Rauch (2003) suggested that SME groups represent content experts as well as lay experts. They recommended that the content experts be very competent in the research topic, and the lay experts should reflect the participants expected to participate in the study.

The SME group included in this review had content knowledge and a learner-perspective since they participated in the eLearning program as students in previous years. Two academic scholars with CPD eLearning expertise as well as three academic scholars whose expertise was not CPD eLearning-related reviewed the survey questions, content, and format. These SMEs reviewed the items in all the categories for clarity and appropriateness.

The researcher asked the SME group described above to review, rate, and provide comments on all the survey items. Of the 14 SMEs that provided instrumentation feedback, one expert provided feedback via email instead of rating the items. Of the 10 experts who responded via Qualtrics, only 8 submitted their complete feedback in the time allotted. This response rate was in alignment with the best practice when generating the content validity index (CVI) for survey questions (Lynn, 1986; Polit & Beck, 2006). The item-level CVI (I-CVI) was calculated for each item by computing the number of experts that rated it on the high end of the scale (3 or 4), and then dividing that number by the total number of experts that rated that particular item. With six or more raters, it is recommended that the I-CVI be no lower than .78 (Lynn, 1986; Polit & Beck, 2006).

The SME review involved a three-step process on most of the survey items. The researcher followed this process to ensure that the questions had a higher content validity or likelihood of measuring the intended domain (Hinkin, 1995; Polit & Beck, 2006). Inter-rater consistency was key as well as ensuring the consideration of multiple points of view (Hinkin, 1995). The SME group was asked to rate items using a four-point Likert scale of Not Relevant, Somewhat Relevant, Quite Relevant, or Highly Relevant (Lynn, 1986; Polit & Beck, 2006). Since this survey had questions on quality, the researcher also asked the SME group to determine if they thought the question best fit with Information Quality, System Quality, or Service

Quality. The questions relevant to motivation also allowed the SMEs to provide their thoughts on whether they would classify motivation as Extrinsic or Intrinsic. The SME group was further asked to rate the clarity of each statement by choosing Not Clear, Somewhat Clear, Quite Clear, and Very Clear. All the items allowed the SME group to provide additional comments as well.

The inter-rater agreement was analyzed based on the raters' responses about the scales in this study. Items were removed or changed if general consensus found they were difficult to understand. The researcher remained mindful of the recommendation that .78 was the minimum acceptable level for the content validity index of the individual items (Polit, Beck, & Owen, 2007) and kept intact those items that fell between .78 and 1.00. The researcher revised or deleted those items that fell in between .44 and .67.

Through the Qualtrics system, the researcher provided a snapshot of what would be visible to the participants. Thus, the SME group was able to provide feedback on the form's aesthetics well. Their feedback led to content changes as well as aesthetic presentation.

3.8.2 The eLearning Satisfaction and Success Survey

Feedback solicited from the SME review process resulted in this final survey instrument: the eLearning Satisfaction and Success (eLSS) survey. Since the learners' perception was key to the completion and success of CPD eLearning, the instrument was a self-perception survey that gathered learner expectations, perceptions, and intentions and was based on the work of Lin (2007), Premkumar and Bhattacherjee (2008), and others.

The following section is dedicated to operationally defining the key constructs and variables in this study. The initial part of the survey collected the key variables analyzed in this study. The last questions were to collect participant demographics. Forty-two survey items measured responses on a 6-point Likert-type scale from Strongly Disagree to Strongly Agree.

Ten survey items were excluded for demographics. The other 22 items were measured using different scales, which have been described on the following pages.

Information Quality Expectation (IQE) was what learners anticipated from the CPD eLearning content. In this research study, the information quality measures focused on the following as listed in Table 2: learning new skills and knowledge, meeting learning needs, and having current, relevant, and accurate information. A sample item is "The XXXXX eLearning would provide accurate information." The researcher totaled and averaged the five items represented in Table 2 measured here to represent this construct. Cronbach's alpha for the IQE measure in this study was .955.

Table 2. Information Quality Expectation (IQE) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
Using XXXXX eLearning would help me learn new skills and knowledge.	Adapted	Premkumar and Bhattacherjee, 2008	0.89
The XXXXX eLearning information would meet my learning needs.	Adapted	Lin, 2007; Chen 2012	0.78
The XXXXX eLearning would provide up-to-date information.	Adapted	Lin, 2007; Cheng, 2012; Hsu et al., 2014	0.81
XXXXX eLearning would provide relevant information and topics for my job/role.	Adapted	Lin, 2007	0.80
The XXXXX eLearning would provide accurate information.	Adapted	Lin, 2007	0.71

Service Quality Expectation (SrQE) was what learners anticipated from the support that they received while they used the CPD eLearning. In this research study, the service quality

measures focused on the following as listed in **Error! Reference source not found.**: registration and enrollment process, quick response from staff, and dependability. A sample item is "XXXXX eLearning staff would be dependable." The three items measured here were then totaled and averaged to represent this construct. Cronbach's alpha for the SrQE measure in this study was .918.

Table 3. Service Quality Expectation (SrQE) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
XXXXX eLearning would have an easy to use registration and enrollment process.	Adapted	Lin, Chen, and Fang, 2011	0.85
If faced with difficulty, XXXXX eLearning staff would provide a quick response.	Adapted	Cheng, 2012; Hsu et al., 2014; Udo et al., 2011	0.78
XXXXX eLearning staff would be dependable.	Adapted	Lin, 2007	0.79

System Quality Expectation (SyQE) was what learners anticipated from the CPD eLearning system as far as technical presentation. In this research study, the system quality measures focused on the following as listed in Table 4: flexibility to learn on their own time, ease of use, continual accessibility, working functions, attention-keeping materials, and self-paced learning. A sample item is "The XXXXX eLearning system would be easy to use." The six items measured here were then totaled and averaged to represent this construct. Cronbach's alpha for the SyQE measure in this study was .937.

Table 4. System Quality Expectation (SyQE) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
Using XXXXX eLearning would provide me flexibility to learn on my own time.	Adapted	Premkumar and Bhattacherjee, 2008	0.88
The XXXXX eLearning system would be easy to use.	Adapted	Lin, 2007; Chen 2012	0.87
The XXXXX eLearning system would always be accessible.	Adapted	Cheng, 2012; Chen, 2012	0.83
The functions of the XXXXX eLearning system would work well.	Adapted	Chen, 2012	0.83
XXXXX eLearning would have course materials that would keep my attention.	Adapted	Lin, 2007	0.85
Using XXXXX eLearning would give the ability to learn at my own pace.	Adapted	Premkumar and Bhattacherjee, 2008	0.86

Learning Quality Expectation (LQE) represented the overall measure of the anticipated learning experience in CPD eLearning. This measure was calculated by adding all 14 items that represented the quality expectation variables and averaging that total to represent this construct.

Participants were instructed to answer the expectation measures based on the knowledge or beliefs they had before they used the CPD eLearning. Perception measures were then related to the knowledge or beliefs they had after using the CPD eLearning. These items, based on Premkumar and Bhattacherjee (2008), were adapted to fit this context, to include the focus on

quality, and to be based on research from DeLone and McLean (1992). Cronbach's alpha for the LQE measure in this study was .963.

Information Quality Perception (IQP) was how learners perceived the offered CPD eLearning content. In this research study, the information quality measures focused on the following as listed in Table 5: learning new skills and knowledge, meeting learning needs, and having up-to-date, relevant, and accurate information. A sample item is "The XXXXX eLearning provided accurate information." The five items measured were then totaled and averaged to represent this construct. Cronbach's alpha for the IQP measure in this study was .956.

Table 5. Information Quality Perception (IQP) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
Using XXXXX eLearning helped me learn new skills and knowledge.	Adapted	Premkumar and Bhattacherjee, 2008	0.89
The XXXXX eLearning information met my learning needs.	Adapted	Lin, 2007; Chen 2012	0.78
The XXXXX eLearning provided up-to-date information.	Adapted	Lin, 2007; Cheng, 2012; Hsu et al., 2014	0.81
XXXXX eLearning provided relevant information and topics for my job/role.	Adapted	Lin, 2007	0.80
The XXXXX eLearning provided accurate information.	Adapted	Lin, 2007	0.71

Service Quality Perception (SrQP) was what learners perceived about the support they received while they used the CPD eLearning. In this research study, the service quality measures focused on the following as listed in Table 6: registration and enrollment process, quick response from staff, and dependability. A sample item is "XXXXX eLearning staff was dependable." The three items measured were then totaled and averaged to represent this construct. Cronbach's alpha for the SrQP measure in this study was .857.

Table 6. Service Quality Perception (SrQP) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
XXXXX eLearning had an easy to use registration and enrollment process.	Adapted	Lin, Chen, and Fang, 2011	0.85
When faced with difficulty, XXXXX eLearning staff provided a quick response.	Adapted	Cheng, 2012; Hsu et al., 2014; Udo et al., 2011	0.78
XXXXX eLearning staff was dependable.	Adapted	Lin, 2007	0.79

System Quality Perception (SyQP) was how learners perceived the CPD eLearning system's technical performance. In this research study, the system quality measures focused on the following as listed in Table 7: flexibility to learn on their own time, ease of use, continual accessibility, working functions, attention-keeping materials, and self-paced learning. A sample item is "The XXXXX eLearning system was easy to use." The six items measured were then totaled and averaged to represent this construct. Cronbach's alpha for the SyQP measure in this study was .917.

Table 7. System Quality Perception (SyQP) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
Using XXXXX eLearning provided me flexibility to learn on my own time.	Adapted	Premkumar and Bhattacherjee, 2008	0.88
The XXXXX eLearning system was easy to use.	Adapted	Lin, 2007; Chen 2012	0.87

(table cont'd.)

Measure	Type	Source	Previous Reliability/ Loading
The XXXXX eLearning system was always accessible.	Adapted	Cheng, 2012; Chen, 2012	0.83
The functions of the XXXXX eLearning system worked well.	Adapted	Chen, 2012	0.83
XXXXX eLearning had course materials that kept my attention.	Adapted	Lin, 2007	0.85
Using XXXXX eLearning gave me the ability to learn at my own pace.	Adapted	Premkumar and Bhattacherjee, 2008	0.86

Learning Quality Perception (LQP) represented the overall measure of the learners' perception of the CPD eLearning learning experience. This measure was calculated by adding all 14 items that represented the quality perception variables and averaging that total to represent this construct. Cronbach's alpha for the LQP measure in this study was .955.

Disconfirmation (DSC) was when learners compared their expectations to their perceptions of performance that they received. In this research study, disconfirmation measured the following as listed in Table 8: learning new skills and knowledge, flexibility to learn on own time, self-paced learning, the information, the system, usability, the experience, and the technical support. A sample question is "My experience with using XXXXX eLearning was _____." Participants responded to seven items, indicating their feelings about each item based on a seven-point Likert-type scale from Much Worse Than Expected to Much Better Than Expected. The total score was then calculated by averaging the responses on each of the

seven items. Participants saw seven items for this construct initially. One question involves technical support, and if participants answered Yes to having the required technical support, they also had a question about the technology. Cronbach's alpha for the DSC measure in this study was .966, excluding the question about technology support. With the technology support question, it was at .938.

Table 8. Disconfirmation (DSC) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
To help me learn new skills and knowledge was _____.	Adapted	Premkumar and Bhattacherjee, 2008	0.90
The flexibility to learn on my own time was _____.	Adapted	Premkumar and Bhattacherjee, 2008	0.92
The ability to learn at my own pace was _____.	Adapted	Premkumar and Bhattacherjee, 2008	0.92
XXXXX eLearning information was _____.	Adapted		Not Available
XXXXX eLearning system performance was_____.	Adapted		Not Available
XXXXX eLearning usability was _____.	Adapted		Not Available
Did you require any technical support while using XXXXX eLearning? (Y/N) [a]	Adapted		Not Available
The technical support provided was _____. [a]	Adapted		Not Available

Note: [a] These items were not included in overall DSC scale.

Satisfaction (SAT) was a measure of how well the learners approved of or liked the CPD eLearning. In this research study, satisfaction measured feelings about the following as listed in **Error! Reference source not found.**: use of CPD eLearning, the CPD eLearning experience, their enrollment decision, CPD eLearning offering, and the overall learning experience. A

sample of the different response measures included Very Displeased to Very Pleased. This item corresponded to the "I am _____ with my use of XXXXX eLearning." Each one was measured on a 6-point scale with different endpoints. The total score was calculated by averaging the responses for each of the five items. Cronbach's alpha for the SAT measure in this study was .956.

Table 9. Satisfaction (SAT) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
I am _____ with my use of XXXXX eLearning.	Adapted	Lankton and McKnight, 2012; Lin, 2007; Premkumar and Bhattacherjee, 2008	0.94
I feel _____ with my XXXXX eLearning experience.	Adapted	Lankton and McKnight, 2012; Premkumar and Bhattacherjee, 2008	0.95
I feel _____ with my decision to register and participate in XXXXX eLearning.	Adapted	Premkumar and Bhattacherjee, 2008	Not Available
I feel _____ with what XXXXX eLearning offers.	Adapted	Premkumar and Bhattacherjee, 2008	Not Available
Overall, I feel _____ with the learning experience that XXXXX has given me.	Adapted	Lankton and McKnight, 2012; Lin, 2007; Premkumar and Bhattacherjee, 2008	Not Available

Continuance Intention (CI) was the stated likelihood of learners to engage in a particular behavior. In this research study, continuance intention measured the following as listed in Table

10: intention to access more courses in this CPD eLearning, intention to access first responder-related CPD eLearning in other systems, and intention to use other CPD eLearning. A sample question was "I intend to continue using XXXXX eLearning to access more courses." The total score was calculated by averaging responses for the first three items.

Survey participants were also asked to estimate the number of courses they intended to take in this CPD eLearning. The item used was "I intended to complete _____of the 7 XXXXX eLearning." Participants indicated their estimate by selecting a number from a drop-down box. Cronbach's alpha for the three questions on the CI measure in this study was .871. When the researcher combined the three questions with the question about how many courses the learners planned to complete, Cronbach's alpha for the CI measure was .706. For this reason, the study used the first three questions in this construct.

Table 10. Continuance Intention (CI) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
I intend to continue using XXXXX eLearning to access more courses.	Adapted	Cho, Cheng, and Hung, 2009; Lin, 2007; Premkumar and Bhattacherjee, 2008	0.81
I intend to use other emergency response related eLearning systems to access more courses.	Adapted	Cho, Cheng, and Hung, 2009; Premkumar and Bhattacherjee, 2008	Not Available
I intend to use eLearning systems to access other educational courses.	Adapted	Cho, Cheng, and Hung, 2009; Premkumar and Bhattacherjee, 2008	Not Available
I intended to complete _____ of the seven XXXXX eLearning courses. [a]	Adapted		Not Available

Note: [a] This item was not included in overall CI scale.

Continuance Behavior (CB) was participants' actual use of or completion in CPD eLearning. Continuance in this study was reported by participants in terms of which parts of the course they had completed. The researcher gathered this data by having participants select how much of the course they had accessed as indicated by the questions in Table 11. Initial analysis indicated that the variables represented in this measure served the study better when they were measured and analyzed separately. These options included Did Not Intend to Take This Course; Nothing Completed; Pre-test; Pre-test and Course Content; and, Pre-test, Course Content, and Post-test. This measure only calculated for courses that were fully completed. The count was either 0 (not completed) or 1 (completed). The total number of actual courses completed was reported in this measure as Actual Continuance Behavior (ACB).

Table 11. Continuance Behavior (CB) Construct Items

Measure	Type	Source	Previous Reliability/ Loading
I have completed the following sections in the following courses:	Adapted	Bhattacherjee, Perols, and Sanford, 2008	Not Available
I completed XXXXX eLearning courses as I intended. [a]	Adapted		Not Available

Note: [a] This item was not included in overall CB measure.

Participants were also asked to rate on a Likert scale whether they completed the courses that they intended to complete. This number was for comparison against what they actually completed and was represented as Continuance Behavior Compared (CBC).

Motivation (MOT) was either Intrinsic (IMOT) or Extrinsic (EMOT). Motivation showed what participants valued, or thought was important; it helped direct energy towards a particular goal. In this research study, motivation measured why learners used CPD eLearning on the following as listed in Table 12: increase sense of accomplishment, improve status among peers, increase chances of obtaining rewards, believe that it is worthwhile, and satisfy an

organizational requirement. A sample question was "I use XXXXX eLearning to increase my sense of accomplishment."

Table 12. Motivation (MOT) Construct Items with Intrinsic (IMOT) Identified

Measure	Type	Source	Previous Reliability/ Loading
I use XXXXX eLearning to increase my sense of accomplishment. (IMOT)	Adapted	Lin, 2007; Chen, 2012; Pereira et al., 2015	0.88
I use XXXXX eLearning to improve my status among my peers. [a]	Adapted	Lin, 2007	0.81
I use XXXXX eLearning to increase my chances of obtaining rewards (e.g. promotion, pay increase, etc.). [a]	Adapted	Lin, 2007	0.85
I believe it is worthwhile for me to use XXXXX eLearning. (IMOT)	Adapted	Lin, 2007; Chen, 2012	0.93
I use XXXXX eLearning to satisfy an organizational requirement. [a]	Adapted	Chen, 2012	0.89

Note: [a] These items were not included in overall IMOT scale.

This measure had two subscales—one for extrinsic and the other for intrinsic motivation. The total score for Intrinsic Motivation was calculated by averaging the responses to the two items referencing sense of accomplishment and it being worthwhile. The other three items were then totaled and calculated by averaging those responses. Cronbach's alpha for the IMOT measure in this study was .743. Cronbach's alpha for the EMOT measure in this study was .797. Joined together, Cronbach's alpha for the MOT measure in this study was .835. Only the IMOT measure is referenced later in this study.

The researcher attempted to use the General Satisfaction (GS) construct as a marker variable (MV) in the procedure that would be used for response bias comparison. Based on similar items from the Neutral Objects Satisfaction Questionnaire (NOSQ) (Eschleman &

Bowling, 2010), these questions (Table 13) were selected because they had no known relevance to the constructs of focus used in this study. The researcher expected a correlation of 0 (Lindell & Whitney, 2001). Although initial correlation analysis supported the selection of GS as a marker variable, further analysis failed to support this selection. Individual item correlation did revealed that a few of the items showed very weak or no correlation to the items of focus in this study. The 6-point Likert-scale range was from Strongly Disagree to Strongly Agree on these items. Cronbach's alpha for the GS measure in this study was .828.

Table 13. General Satisfaction (GS) Construct Items for Common Method Variance

Measure	Type	Source	Previous Reliability/Loading
I am satisfied with the city in which I live.	Adapted	Eschleman and Bowling, 2010	Not available
I am satisfied with my co-workers.	Adapted	Eschleman and Bowling, 2010	Not available
I am satisfied with the people that I know.	Adapted	Eschleman and Bowling, 2010	Not available
I am satisfied with my friends.	Adapted	Eschleman and Bowling, 2010	Not available
I am satisfied with restaurant food.	Adapted	Eschleman and Bowling, 2010	Not available

The demographics section followed by asking questions on age range, primary professional discipline (options obtained from the CPD eLearning program), length of time in current profession (range options), current city of employment, current state of employment (drop-down box), length of time in current position (range options), number of professional development courses taken online (range options), gender (options, but optional), and highest level of education (options). Participants were also asked if they obtained any of their education online (checkboxes). Participants had the opportunity to provide their phone number as an additional contact option for the gift card drawings.

3.9 Procedure for Pilot Test

After the SME review, the researcher piloted the revised survey to a group of learners that registered with the CPD eLearning program in April 2014. The researcher determined that participants would take the pilot survey in January 2015. This decision ensured the pilot and actual study participants would have a similar make-up and excluded the pilot participants from the actual study, since it fell outside the previously stated window of time for the actual study participants.

The pilot test included learners who registered for eLearning in April 2014. Since this group would not be participating in the actual study, it became a good group on which to test the questions and from which to gather feedback. The researcher obtained email addresses (n = 144) to test the questions on a similar sample of learners. Of the 144 learners, 25 (17%) started the survey, while 17 (11.8%) actually completed the survey over a one-week period in February 2015. The states of Alabama, Arizona, California, Florida, Georgia, Illinois, New Jersey, New Mexico, New York, Ohio, Oklahoma, Texas, and Wisconsin were represented in this pilot test group. Almost 30% of the pilot participants were between the ages of 23 and 30, 88% were male, and 41% had been in their positions between 1–5 years. Over 70% of the pilot participants classified themselves as from fire service or law enforcement, or they selected the Other category. Around 35% of the pilot participants claimed to have been in their current profession between 6–10 years. Thirty-five percent of the learners in this pilot test had a 1-year certificate, whereas 23% claimed to have achieved more than a 4-year degree. Most of the pilot participants were familiar with online learning with over 52% responding that they had taken more than five eLearning courses. A summary of more detailed demographic information has been included in Table 14.

Table 14. A Detailed Profile of the Pilot Respondents

Age, Gender					
Age	*N*	%	Gender	*N*	%
18–22	1	5.9	Male	15	88.2
23–30	5	29.4	Female	2	11.8
31–40	4	23.5			
41–50	4	23.5			
51–60	1	5.9			
61–75	0	0			
> 75	2	11.8			
Total	17	100.0	Total	17	100.0

Primary Professional Discipline, Years in Profession, Years in Position								
Primary Professional Discipline	*N*	%	Years in Profession	*N*	%	Years in Position	*N*	%
Emergency Management Service	1	5.9	< 1 year	1	5.9	< 1 year	3	17.6
Emergency Medical Services	1	5.9	1–5 years	3	17.6	1–5 years	7	41.2
Fire Service	4	23.5	6–10 years	6	35.3	6–10 years	3	17.6
Governmental Administrative	1	5.9	11–15 years	3	17.6	11–15 years	2	11.8
Hazardous Materials Personnel	0	0	16–25 years	3	17.6	16–25 years	1	5.9
Healthcare	1	5.9	> 25 years	1	5.6	> 25 years	1	5.9
Law Enforcement	4	23.5						
Public Health	0	0						
Public Safety Communications	1	5.9						
Student	0	0						
Other	4	23.5						
Total	17	100.0	Total	17	100.0	Total	17	100.0

Highest Level of Education, History with Online Course					
Highest Level of Education	*N*	%	History with Online Courses	*N*	%
High school	1	5.9	0	1	5.9
1-year certification	6	35.3	1–2	2	11.8
2-year associate degree	4	23.5	3–5	5	29.4
4-year degree	2	11.8	> 5	9	52.9
More than a 4-year degree	4	23.5			
Total	17	100.0	Total	17	100.0

The researcher calculated and reviewed reliability scores for the subsets and the overall survey in the form of Cronbach's alpha based on the data collected from this pilot group. Based on information gathered in Table 15, all reliability calculations returned with a minimum of α = .80; this result was more than acceptable for this research exceeding normative standards of .79 or higher (Nunnally, 1978).

Table 15. Reliability Statistics of Scales for Pilot Testing

Item Scale	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	*N* of Items
IQE	0.960	0.963	5
SyQE	0.912	0.919	6
SrQE	0.894	0.902	3
LQE	0.956	0.960	14
IQP	0.977	0.977	5
SyQP	0.981	0.981	6
SrQP	0.946	0.946	3
LQP	0.989	0.989	14
DSC	0.987	0.988	7
SAT	0.979	0.979	5
CI	0.927	0.929	3
CB	†	†	1
IMOT	0.966	0.968	2
EMOT	0.936	0.940	3
MOT	0.938	0.947	5
GS	0.860	0.871	5

† In the eLSS, continuance behavior was measured by using only one self-report item, therefore no alpha was available.

Based on the results, the researcher calculated the continuance intention measure in a couple of ways for this study. When the calculation included the number of courses that the pilot participants intended to complete, the reliability score of $\alpha = .654$ fell below acceptable levels. By removing the variable where participants reported the number of courses that they intended to complete, the calculation increased to $\alpha = .927$, which is more acceptable (Nunnally, 1978). For comparison, this study has included and shared all variables for continuance intention.

3.10 Procedure for Actual Survey

To address this study's research questions and hypotheses, the researcher used a survey to collect data from the first responders enrolled in the CPD eLearning course. Because many first responders are located in different states, and all of them registered for this online learning format, the researcher decided to disseminate an online survey. After the date criteria were determined for the sample, the researcher submitted a query request to the CPD eLearning program staff members. The eLearning staff then pulled information from the LMS to produce a full list of those learners that registered within the appropriate parameters previously set by the researcher. This LMS query included first name, last name, agency/company name, work address, city, state, zip, phone number, and email address. After the contact information was compiled into an Excel spreadsheet, the researcher was able to upload this list into the Qualtrics system. The researcher used only the email address for those who helped to test the survey questions. Before the email link to the actual sample was sent out, postcards were created and mailed to the work addresses that were in the LMS.

One week after the post cards were mailed, the study participants were sent a self-administered survey link directly from the Qualtrics system. The researcher sent out an initial notification through postal mail before sending the emailed link in hopes of improving the response rate (Dillman, 2000; Millar & Dillman, 2011; Punch, 2003). This initial notification

provided a link to the survey; it also listed gift card amounts that study participants could win over the data collection period to promote the survey completion (Millar & Dillman, 2011). The research protocol included information about the availability of the survey for data collection from February 2015 to March 2015.

After reviewing the literature, the researcher selected specific variables appropriate for this study. The procedures to collect the data were as follows:

1. Mailed the pre-notification letter.
2. Sent an email link to the survey with a cover letter one week later.
3. Sent a follow-up survey email two weeks later.
4. Sent a second follow-up survey email three weeks later.
5. Emailed a thank you and reminder card four weeks later.

Actual copies of the correspondence can be found in Appendices A–C. Participants received specific instructions for completing and submitting the survey.

3.11 Analytic Strategy

In this study, the researcher was interested in determining if relationships existed between and among various constructs. In an attempt to investigate factors which may account for CPD eLearning participation and completion, this study examined adult learners to advance understanding of the relationships among expectations of quality, perceptions of quality, disconfirmation, and satisfaction. This investigation also explored whether learner motivation moderated the relationship between satisfaction and continuance intention or satisfaction and actual continuance behavior. The researcher conducted correlational analyses for hypotheses 1 through 9 to determine if any correlations existed amongst the analyzed variables (Cresswell, 2013). Hypotheses 10 and 11 used the PROCESS macro in SPSS to test the moderation effects on two constructs.

3.12 Statistical Power and Sample Size

The researcher considered both statistical power and sample size to ensure proper hypotheses testing for the statistical tests that were employed. In any research, the goal has been to ensure that there was a high probability of correctly rejecting the null hypothesis. Statistical power has depended on these three things: effect size, alpha level (α, or significance criterion), and sample size (Cohen, 1992). Erroneous results may occur when power has not been properly calculated. Type I error, α, has the probability of rejecting the null hypothesis when it was actually true. Type II error, β, has the probability of not rejecting the null hypothesis when it should be rejected. Many researchers have compiled sample size rules of thumb to follow based on the specific statistical analysis. Cohen (1992) suggested that acceptable levels of power included an alpha level of at least .05 with power levels of 80%. Since sample size has been such a vital component in determining statistical power, it has presented an interesting challenge to researchers. A rule of thumb provided by some researchers has been to have 10–15 cases per study indicator.

The data analysis plan included various measures to ensure that the data sample was of acceptable quality. The majority of the data analysis was conducted in the SPSS program. Data was reviewed for any missing or invalid values using frequency tables. This study ignored any missing data that was no more than 10% and appeared to be random. The researcher reviewed outliers, normality, and data ranges, which helped to determine the tests for further analysis. Values for the construct means were also reviewed for any significance. Correlational values were obtained to determine relationships between the constructs for the majority of hypotheses. T-tests and analysis of variance techniques were instrumental in determining if significant differences existed between certain groups. SPSS was also used in conjunction with the

PROCESS macro to investigate and analyze the interaction of the intrinsic motivation variable and satisfaction to determine if moderation existed. The PROCESS macro used ordinary least squares or logistic regression-based path for estimating effects (Hayes, 2013). This technique was applied to test the moderation influences proposed in hypotheses 10 and 11. Moderation analysis has often assisted in testing if the extent of the effect between two variables depends on a third or additional set of variables (Hayes, 2012).

3.13 Common Method Variance Consideration

Simmering (2015) found that the method of data collection could present a systematic variance, resulting in inflated relationships among variables. This issue, called common method variance (CMV), is often cause for concern in behavioral research. Since this study used data that were collected through a self-reported survey, CMV was considered as a possible influence. Measurement error tends to threaten the validity of outcomes about relationships found between measures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). There are many potential sources of CMV which often fall into different categories including common rater effects, item characteristic effects, item context effects, and measurement context effects (Podsakoff et al., 2003). Common rater effects could have included needing to maintain consistency between cognitions and attitudes, needing social approval and acceptance, believing in the presence of certain correlations, having the tendency to agree or disagree regardless of content, needing to let their mood affect their answers, or allowing a recent mood to affect answers. Item characteristic effects included using the same-scale format, having items that are more socially desirable, having items that contain hidden cues on how to answer, using the same anchor points, having ambiguous items that allow random responses, or using positive or negative wording. Item context effects included the position of the predictor variable in a noticeable place that makes causal relationships likely, neutral items near positive or negative items that take on that nearby

property, the first item inducing mood to other questions, responses to previous items affecting others since they are in short-term memory, and the mix of items from different constructs that decrease intra-construct correlations. Finally, measurement context effects included different constructs being measured at the same time, the same location, and with the same medium. Any one of these effects have been known to limit a study's validity.

3.13.1 Research Design

The Likert scales used in this study varied depending on the construct being measured. This research employed a subtle, but different, variation on the choices.

3.13.2 Statistical Approach

This study tested for common method bias in a few ways. Although the CFA approach, Harman's single factor test, has not been as reputable and has several limitations (Podsakoff et al., 2003), this research used it as an initial test to see if the majority of the variance could be explained by a single factor. After an initial attempt to use a marker variable or scale that was unrelated to the other variables in this study, the researcher decided to abandon that scale for testing CMV since it was found to be significantly correlated to several of this study's variables. As a result, the researcher used the common latent factor technique in SPSS AMOS; this introduced a new latent variable and related all observed variables to this common factor. Each path was constrained to be equal, and the variance of the common factor was set to 1.

3.14 Ethical Considerations and Study Approval

The researcher sought appropriate approval before conducting this study. An application for exemption from institutional oversight was submitted to the LSU Institutional Review Board (IRB). The approval for this study with exempt status (IRB#E9143) was granted on January 15, 2015 by Dennis Landin, Chairman. Please refer to Appendix E for a copy of the approval.

CHAPTER 4. RESULTS

The researcher conducted quantitative, descriptive research to investigate factors that could account for CPD eLearning satisfaction and completion by examining first responders enrolled in a CPD eLearning training course. Structured data collection was aimed at the following measurements:

1. Measuring quality in expectation, perception, and disconfirmation constructs to determine how they relate to satisfaction
2. Measuring the link between continuance intention and continuance behavior with satisfaction to determine the relationship
3. Measuring the moderation of intrinsic motivation on satisfaction and continuance intention as well as on satisfaction and continuance intention

The methods of data collection and data analysis were discussed in Chapter 3. This chapter presents the research findings and discusses the reliability and validity assessments, results of the hypotheses tests, and the outcome of the common method variance (CMV) analysis.

4.1 Descriptive Data

Demographics collected from the study participants are presented in Table 16. This information includes the professionals' age, gender, primary professional discipline, years in the profession, years in their position, highest level of education, and their history with taking online courses.

Table 16. Detailed Profile of Respondents in Study

Age, Gender					
Age	*N*	%	Gender	*N*	%
18–22	13	6.0	Male	179	82.5
23–30	42	19.4	Female	37	17.1
31–40	59	27.2	Not Supplied	1	0.5
41–50	64	29.5			
51–60	8	3.7			
61–75	2	0.9			
> 75	29	13.4			
Total	217	100.0	Total	217	100.0

Primary Professional Discipline, Years in Profession, Years in Position								
Primary Professional Discipline	*N*	%	Years in Profession	*N*	%	Years in Position	*N*	%
Emergency Management Service	17	7.8	< 1 year	18	8.3	< 1 year	46	21.2
Emergency Medical Services	8	3.7	1–5 years	57	26.3	1–5 years	97	44.7
Fire Service	15	6.9	6–10 years	49	22.6	6–10 years	34	15.7
Governmental Administrative	1	0.5	11–15 years	30	13.8	11–15 years	20	9.2
Hazardous Materials Personnel	3	1.4	16–25 years	43	19.8	16–25 years	17	7.8
Healthcare	8	3.7	> 25 years	20	9.2	> 25 years	3	1.4
Law Enforcement	102	47.0						
Public Health	6	2.8						
Public Safety Communications	11	5.1						
Student	4	1.8						
Other	42	19.4						
Total	217	100.0	Total	217	100.0	Total	217	100.0

Highest Level of Education, History with Online Course					
Highest Level of Education	*N*	%	History with Online Courses	*N*	%
High school	54	24.9	0	21	9.7
1-year certification	28	12.9	1–2	39	18.0
2-year associate degree	54	24.9	3–5	36	16.6
4-year degree	41	18.9	> 5	121	55.8
More than a 4-year degree	40	18.4			
Total	217	100.0	Total	217	100.0

There were 217 respondents who were valid for the hypotheses analysis. The response rate for this study was 23.8% for started surveys. However, only 17.1% of the started surveys were considered complete and useable. Of the 217 respondents, which represented 38 of the 50 states in the United States, the majority identified as male (82.5%) and were in the 41–50 age range (29.5%). Forty-seven percent (47%) were in the law enforcement profession, 26.3% had been in their profession for 1–5 years, 55.8% reported taking more than five online courses before this CPD eLearning course, and almost half had either a 2-year associate degree or high school diploma as their highest level of education.

4.2 Preliminary Analysis

Preliminary analyses were conducted to test the fit of the data for inclusion in the test of this study's hypotheses. First, P-P plots were conducted to determine where normality could be assumed for the data. Initial review showed signs that normality could not be assumed.

Additionally, the researcher reviewed a scatterplot view of the residuals to reveal any linearity as well as homoscedasticity. These reviews revealed that not much of the data was conforming to linearity. The researcher also checked the data for any missing or invalid values; a small percentage of the data was missing randomly for a few of the cases ($N = 6$). The researcher used the Replace Missing Values tool on these cases for the majority of the research. However, these six cases were dropped in the model analysis.

The researcher screened and analyzed some demographic variables (such as age, gender, primary professional discipline, and years in profession) to determine whether to apply any controls. The researcher's review on age, level of education, and gender found no significant difference or effect based on these variables.

The researcher performed an independent samples T-test to review significance based on gender. After reviewing each of the results based on Levene's test, corresponding *p* values, all

were found to be greater than $p = .05$. The researcher failed to reject the null and concluded that any variance between male and female participants was not significantly different (for example, the satisfaction construct showed no significant difference between male and female participants [$t_{214} = -.940$, $p = .348$]). Therefore, the researcher did not explore gender as a control or covariate variable.

The researcher performed a one-way analysis of variance (ANOVA) to determine if a statistically significant difference existed between the age groups represented in this study. The investigation focused on determining the impact that age had on primary professional discipline, years in their profession, years in their position, continuance intention, continuance behavior, learning quality expectation, learning quality perception, and online training history. The following six age groups were included: 18–22, 31–40, 41–50, 51–60, 61–75, and older than 75. There was a statistically significant difference at the $p < .001$ level for online history $F(6, 210) = 6.44$, years in the profession $F(6, 210) = 14.79$, and years in the position $F(6, 210) = 9.15$. A large effect size, calculated using eta squared, was found for online history which was .15. Post-hoc comparisons using Tukey HSD test indicated that the mean score for those in the 18–22 age group was significantly different from 31 to 40 year olds, 41 to 50 year olds, 51 to 60 year olds, and those over 75 years old. Post-hoc comparisons using Tukey HSD test also indicated that the mean score for those in the 23–30 age group was significantly different from 31 to 40 year olds, 41 to 50 year olds, and those over 75 years old. A very large effect size, calculated using eta squared, was also found for years in the position which was .21. Post-hoc comparisons using Tukey HSD test indicated that the mean score for those in the 18–22 age group was significantly different from 41 to 50 year olds and for those over 75 years old. Post-hoc comparisons using Tukey HSD test also indicated that the mean score for those in the 23–30 age group was

significantly different from 31 to 40 year olds, 41 to 50 year olds, and those over 75 years old. Both intrinsic motivation and continuance intention also found a statistical significance at the $F(6, 210) = 1.92$, $p = .002$ and $F(6, 210) = 2.20$, $p = .008$, respectively. The effect size, calculated using eta squared, for both intrinsic motivation and continuance intention was .05. This indicated a medium effect size. Post-hoc comparisons using Tukey HSD test for continuance intention indicated that the mean score for those in the 18–22 age group was significantly different from those in the 31–40 age group.

Reliability scores in the form of Cronbach's alpha were also calculated based on the data collected from this group of study participants. The researcher calculated and reviewed scores for the subsets and the overall survey. Based on information gathered in Table 15, the majority of the reliability calculations returned with a minimum of $\alpha = .80$ which was more than acceptable for this research exceeding normative standards of .79 or higher (Nunnally, 1978).

4.3 Hypothesis Testing

The researcher conducted correlational analyses for hypotheses 1 through 9 to determine if any correlations existed amongst the analyzed variables. (Table 17 provides detailed information in a full tabular format.) Table 18 provides a synopsis view of the hypotheses testing results. Since the data were not normally distributed and there were a few accepted outliers, the researcher conducted a series of Spearman's rank-order correlations to determine the relationships between variables. The level of significance for this study was set at $\alpha = .05$ since it is a conservative level that protects against making a Type I error.

Table 17. Basic Statistics of the Study

Spearman's Rho	1	2	3	4	5	6	7	8	9	10	11	12	13
1. IQE	1.000												
2. SyQE	.716**	1.000											
3. SrQE	.595**	.788**	1.000										
4. LQE	.840**	.914**	.883**	1.000									
5. IQP	.597**	.498**	.435**	.542**	1.000								
6. SyQP	.391**	.482**	.392**	.471**	.730**	1.000							
7. SrQP	.477**	.521**	.560**	.569**	.688**	.775**	1.000						
8. LQP	.537**	.560**	.510**	.583**	.877**	.910**	.899**	1.000					
9. DSC	.392**	.403**	.385**	.435**	.573**	.652**	.596**	.674**	1.000				
10. SAT	.452**	.393**	.366**	.441**	.670**	.682**	.693**	.745**	.666**	1.000			
11. CI	.384**	.450**	.388**	.437**	.532**	.616**	.599**	.632**	.554**	.647**	1.000		
12. ACB	.122*	.130*	.188**	.173**	.287**	.211**	.267**	.286**	.219**	.313**	.183**	1.000	
13. IMOT	.513**	.524**	.476**	.553**	.602**	.632**	.631**	.672**	.584**	.647**	.649**	.269**	1.000
Mean	5.23	5.18	5.04	5.15	5.29	5.28	5.15	5.24	5.50	5.17	5.11	4.12	4.90
Standard Deviation	0.79	0.77	0.81	0.70	0.84	0.83	0.89	0.77	1.19	0.89	0.98	1.70	1.06
Cronbach's Alpha Reliability	0.96	0.94	0.92	0.87	0.96	0.92	0.86	0.89	0.94	0.96	0.87	---	0.74

Note. *N* = 217. Note. Information Quality Expectation (IQE), System Quality Expectation (SyQE), Service Quality Expectation (SrQE), Learning Quality Expectation (LQE), Information Quality Perception (IQP), System Quality Perception (SyQP), Service Quality Perception (SrQP), Learning Quality Perception (LQP), Disconfirmation (DSC), Satisfaction (SAT), Continuance Intention (CI), Actual Continuance Behavior (ACB), Intrinsic Motivation (IMOT), Mean (M), Standard Deviation (SD).

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 18. Synopsis of Hypotheses and Findings

Hypothesis	Statistical Result	Hypothesis Result
H1a: Information quality expectation is positively related to perception.	Strong Positive Correlation—.597	Supported
H1b: Service quality expectation is positively related to perception.	Strong Positive Correlation— .560	Supported
H1c: System quality expectation is positively related to perception.	Strong Positive Correlation—.482	Supported
H1d: Learning quality expectation is positively related to perception.	Strong Positive Correlation—.583	Supported
H2a: Information quality expectation is negatively related to disconfirmation.	Moderate Positive Correlation—.392	Not Supported
H2b: Service quality expectation is negatively related to disconfirmation.	Moderate Positive Correlation—.385	Not Supported
H2c: System quality expectation is negatively related to disconfirmation.	Strong Positive Correlation—.403	Not Supported
H2d: Learning quality expectation is negatively related to disconfirmation.	Strong Positive Correlation—.435	Not Supported
H3a: Information quality perception is positively related to disconfirmation.	Strong Positive Correlation—.573	Supported
H3b: Service quality perception is positively related to disconfirmation.	Strong Positive Correlation—.596	Supported
H3c: System quality perception is positively related to disconfirmation.	Strong Positive Correlation—.652	Supported
H3d: Learning quality perception is positively related to disconfirmation.	Strong Positive Correlation—.674	Supported
H4a: Information quality expectation is positively related to satisfaction.	Strong Positive Correlation—.452	Supported
H4b: Service quality expectation is positively related to satisfaction.	Moderate Positive Correlation—.366	Supported
H4c: System quality expectation is positively related to satisfaction.	Moderate Positive Correlation—.393	Supported
H4d: Learning quality expectation is positively related to satisfaction.	Strong Positive Correlation—.441	Supported
H5a: Information quality perception is positively related to satisfaction.	Strong Positive Correlation—.670	Supported

(table cont'd.)

Hypothesis	Statistical Result	Hypothesis Result
H5b: Service quality perception is positively related to satisfaction.	Strong Positive Correlation—.693	Supported
H5c: System quality perception is positively related to satisfaction.	Strong Positive Correlation—.682	Supported
H5d: Learning quality perception is positively related to satisfaction.	Strong Positive Correlation—.745	Supported
H6: Disconfirmation is positively related to satisfaction.	Strong Positive Correlation—.666	Supported
H7: Satisfaction is positively related to continuance intention.	Strong Positive Correlation—.541	Supported
H8: Satisfaction is positively related to continuance behavior.	Weak Positive Correlation—.266 (Courses Completed)	Supported
H9: Continuance intention is positively related to continuance behavior.	Weak Positive Correlation—.145 (Courses Completed)	Supported
H10: Intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship between satisfaction and continuance intention.		Partially Supported
H11: Intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship satisfaction and continuance behavior.		Partially Supported

4.3.1 Hypotheses 1a–1d Results

Hypothesis 1 proposed a positive relationship between quality expectations and perceptions. The researcher tested this relationship through a correlational analysis and included the following:

- Information quality expectations to perception ($r_s = .597$, $p < .05$)
- Service quality expectations to perception ($r_s = .560$, $p < .05$)
- System quality expectations to perception ($r_s = .482$, $p < .05$)
- Learning quality expectations to perception ($r_s = .583$, $p < .05$)

The researcher hypothesized that CPD eLearning participants' expectations about quality components had a positive effect on their perception of those same quality components. Through this analysis, the researcher found strong support for a correlation between all four relationships.

4.3.2 Hypotheses 2a–2d Results

Hypothesis 2 proposed a negative relationship between quality expectations and disconfirmations. The researcher tested this relationship through a correlational analysis. Conversely, moderate to strong positive correlations were found in the following:

- Information quality expectations to disconfirmations ($r_s = .392$, $p < .05$)
- Service quality expectations to disconfirmations ($r_s = .385$, $p < .05$)
- System quality expectations to disconfirmations ($r_s = .403$, $p < .05$)
- Learning quality expectations to disconfirmations ($r_s = .435$, $p < .05$)

CPD eLearning participants' expectations about quality components do not have a negative effect on their disconfirmation of CPD eLearning. Through this analysis, the researcher did not find any support for any of the four hypothesized relationships.

4.3.3 Hypotheses 3a–3d Results

Hypothesis 3 proposed a positive relationship between quality perceptions and disconfirmations. The researcher tested this relationship through a correlational analysis and included the following:

- Information quality perceptions to disconfirmations ($r_s = .573$, $p < .05$)
- Service quality perceptions to disconfirmations ($r_s = .596$, $p < .05$)
- System quality perceptions to disconfirmations ($r_s = .652$, $p < .05$)
- Learning quality expectations to disconfirmations ($r_s = .674$, $p < .05$)

Through this analysis, the researcher found strong support for a correlation between all four relationships.

4.3.4 Hypotheses 4a–4d Results

Hypothesis 4 proposed a positive relationship between quality expectations and satisfaction. The researcher tested this relationship through a correlational analysis and included the following:

- Information quality expectations to satisfaction ($r_s = .452$, $p < .05$)
- Service quality expectations to satisfaction ($r_s = .366$, $p < .05$)
- System quality expectations to satisfaction ($r_s = .393$, $p < .05$)
- Learning quality expectations to satisfaction ($r_s = .441$, $p < .05$)

Through this analysis, the researcher found strong support for a correlation between these four relationships.

4.3.5 Hypotheses 5a–5d Results

Hypothesis 5 proposed a positive relationship between quality perceptions and satisfaction. The researcher tested this relationship through a correlational analysis and included the following

- Information quality perceptions to satisfaction ($r_s = .670$, $p < .05$)
- Service quality perceptions to satisfaction ($r_s = .693$, $p < .05$)
- System quality perceptions to satisfaction ($r_s = .682$, $p < .05$)

- Learning quality perceptions to satisfaction ($r_s = .745$, $p < .05$)

Through this analysis, the researcher found strong support for a correlation between these four relationships.

4.3.6 Hypothesis 6 Results

Hypothesis 6 proposed a positive relationship between disconfirmation and satisfaction. The researcher tested this relationship through a correlational analysis. Disconfirmation moved in tandem with satisfaction. Through this analysis, the researcher found strong support for a correlation between disconfirmation and satisfaction ($r_s = .666$, $p < .05$).

4.3.7 Hypothesis 7 Results

Hypothesis 7 proposed a positive relationship between satisfaction and continuance intention. The researcher tested this relationship through a correlational analysis. Satisfaction moved in the same direction as continuance intention. Through this analysis, the researcher found strong support for a correlation between satisfaction and continuance intention ($r_s = .541$, $p < .05$).

4.3.8 Hypothesis 8 Results

Hypothesis 8 proposed a positive relationship between satisfaction and continuance behavior. The researcher tested this relationship through a correlational analysis. Satisfaction also moved in the same direction as continuance behavior. Through this analysis, the researcher found weak support for a correlation between satisfaction and continuance behavior in relation to the reported courses completed by a learner ($r_s = .266$, $p < .05$).

4.3.9 Hypothesis 9 Results

Hypothesis 9 proposed a positive relationship between continuance intention and continuance behavior. The researcher tested this relationship through a correlational analysis.

Continuance intention moved in the same direction as continuance behavior. Through this analysis, the researcher found weak support for a correlation between continuance intention and continuance behavior in relation to the reported courses completed by a learner ($r_s = .266$, $p < .05$).

This study also collected data that could shed some light on the need for programs to find out why learners are there and what they hope to achieve through the eLearning. Participants were asked if they had completed the courses that they intended to complete in the system. Almost 70% agreed to some level that they had. Table 18 reflects that even though many participants did not intend to take several courses, there were still many others who did not get to start and plenty more who did not get to finish courses that they intended to complete.

Table 19. Courses by Completion Level for Participants

	CPD eLearning Course #1		CPD eLearning Course #10		CPD eLearning Course #4		CPD eLearning Course #6		CPD eLearning Course #7		CPD eLearning Course #13	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Did Not Intend to Take	69	31.8	55	25.3	66	30.4	55	25.3	46	21.2	32	14.7
Nothing Completed	77	35.5	90	41.5	89	41.0	94	43.3	78	35.9	82	37.8
Pre-test	5	2.3	10	4.6	6	2.8	8	3.7	13	6.0	7	3.2
Pre-test and Content	14	6.5	10	4.6	10	4.6	10	4.6	11	5.1	11	5.1
Pre-test, Content, and Post-test	52	24	52	24.0	46	21.2	50	23.0	69	31.8	85	39.2
Total	217	100.0	217	100.0	217	100.0	217	100.0	217	100.0	217	100.0

4.3.10 Hypotheses 10 and 11 Results

Hypotheses 10 and 11 proposed the presence of moderating influences from intrinsic motivation. The researcher used the PROCESS macro to estimate the presence of these proposed moderating influences. The data was mean centered through the settings in PROCESS through AMOS.

Hypothesis 10 claimed that intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship between satisfaction and continuance intention. The researcher measured the interaction to see if it affected the continuance intention construct. The overall model was found to be significant: $F(3, 213) = 52.87$, $p < .001$, $R^2 = .51$. This model explained a 51% variance. For every one level increase in IMOT, this research found a .38 unit increase in CI, which was found to be significant: $b = .38$, $t(213) = 4.02$, $p < .001$. For every one level increase in SAT, this research found a .41 unit increase in CI, which was also found to be significant: $b = .41$, $t(213) = 3.84$, $p < .001$. However, the interaction in this model was not found to be significant: $b = -.04$, $t(213) = -.75$, $p = .46$.

The researcher also reviewed the slopes for satisfaction predicting continuance intention at each level of intrinsic motivation in this study. When IMOT was low, SAT $b = .46$, $t(213) = 4.53$, $p < .001$. For low IMOT, every level of SAT gave a .46 increase in CI. When IMOT was at an average level, SAT $b = .41$, $t(213) = 3.84$, $p < .001$. For average IMOT, every level of SAT gives a .41 increase in CI. When IMOT was at a high level, SAT $b = .36$, $t(213) = 2.56$, $p = .01$. For high IMOT, every level of SAT gave a .36 increase in CI. After running the Johnson-Neyman Technique, the researcher did not find a statistical significance transition point with the observed range of the moderator. The researcher plotted the conditional effects on a graph and

included them as Figure 6. Based on these interactions and findings, Hypothesis 10 was partially supported.

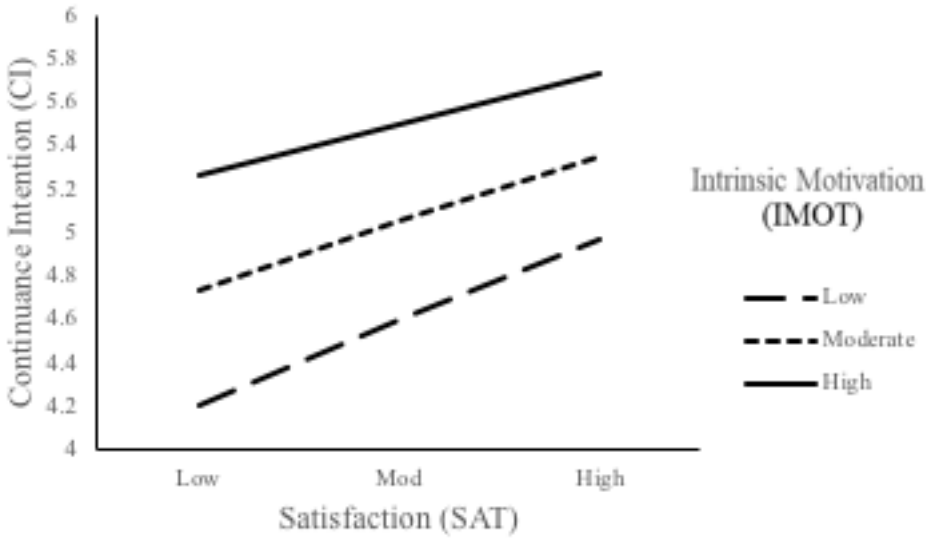


Figure 5. Interaction plot for intrinsic motivation and satisfaction on continuance intention

The continuance behavior construct was represented by the number of courses completed. Hypothesis 11 claimed that intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship between satisfaction and continuance behavior. The researcher measured the interaction to see if it affected the continuance behavior measure. The overall model was found to be significant, $F(3,213) = 10.91$, $p < .001$, $R^2 = .14$. This model explained a 14% variance. For every one level increase in IMOT, this research found a .43 unit increase in CB, which was found to be significant: $b = .43$, $t(213) = 2.67$, $p = .01$. For every one level increase in SAT, this research found a .88 unit increase in CB, which was also considered significant: $b = .88$, $t(213) = 4.40$, $p < .001$. The researcher also found the interaction in this model to be significant: $b = -.55$, $t(213) = 2.67$, $p = .01$.

The researcher also reviewed the slopes for satisfaction predicting continuance behavior at each level of intrinsic motivation. For low or weak IMOT, SAT $b = .30$, $t(213) = 1.35$, $p =$

.18. The researcher found no relation between SAT and CB when IMOT was low. For average IMOT, SAT $b = .88$, $t(213) = 4.4$, $p < .001$. When IMOT was at average level, every unit increase in SAT gave a .88 increase in CB. For high levels of IMOT, SAT $b = 1.46$, $t(213) = 4.09$, $p < .001$. When IMOT level was high, every unit increase in SAT gave a 1.46 increase in CB. Based on these results, the researcher found partial support for this moderation's hypothesis set.

Through the Johnson-Neyman Technique, the analysis reviewed how intrinsically motivated learners have to be for satisfaction level to matter. The results are reported as the zone of significance. When IMOT level was at 4.0, SAT and CB were significantly related: $b = .39$, $t(213) = 1.97$, $p = .05$. As IMOT increased, the relationship between SAT and CB became more positive with the highest IMOT (6.0): $b = 1.49$, $t(213) = 4.07$, $p < .001$. The researcher plotted the conditional effects on a graph (Figure 7). Based on these interactions and findings, Hypothesis 11 was partially supported.

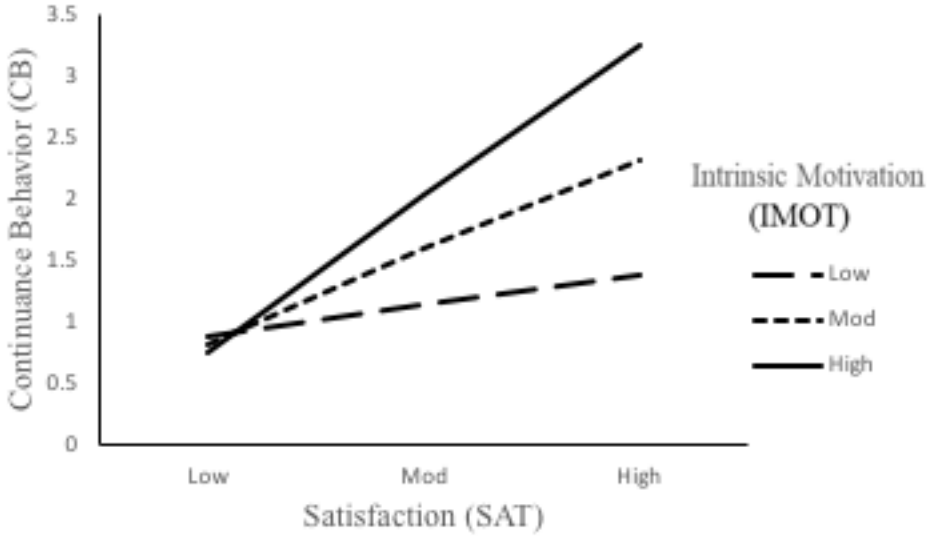


Figure 6. Interaction plot for intrinsic motivation and satisfaction on continuance behavior

Based on these interactions and findings, both Hypothesis 10 and Hypothesis 11 were partially supported.

4.4 Common Method Variance Analysis

Although a priori techniques are optimal, the researcher employed multiple post-hoc statistical detection of common method bias. The researcher used both Harman's single factor and common latent factor techniques to test for CMV effects in this study. The researcher employed a self-reported survey with independent and dependent variables all at one time with similar response types for each question. Some respondents may have perceived the survey as too long. Consequently, the researcher carried out statistical tests to measure the presence of CMV.

Table 22 shows the results on the Harman's single factor technique total variance explained for these variables. After all factors were loaded onto a single factor and constrained with no rotation (Podsakoff et al., 2003), not a single common latent factor explained more than 50% of the variance. Since the first listed factor only explained 36% variance, the researcher surmised that there is no common method bias present. However, this test was pretty sensitive when dealing with many variables in a model, so it may be less conservative. The researcher tested further using the common latent factor technique and found that common method bias may be a problem with several of the factors.

Table 20. Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	24.250	50.521	50.521	17.285	36.010	36.010	16.601
2	6.225	12.968	63.489	6.716	13.992	50.002	16.652

(table cont'd.)

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
3	2.909	6.060	69.549	7.093	14.777	64.779	15.229
4	1.997	4.160	73.709	2.686	5.595	70.374	9.582
5	1.431	2.981	76.690	1.196	2.491	72.865	9.461
6	1.292	2.692	79.382	1.380	2.876	75.741	9.023
7	1.194	2.487	81.869	.952	1.983	77.724	13.726
8	.925	1.927	83.795				
9	.858	1.788	85.583				
10	.759	1.580	87.163				
11	.644	1.342	88.506				
12	.573	1.195	89.700				
13	.503	1.048	90.748				
14	.438	.913	91.661				
15	.397	.826	92.487				
16	.379	.789	93.275				
17	.330	.687	93.963				
18	.315	.656	94.619				
19	.302	.629	95.248				
20	.274	.570	95.818				
21	.248	.516	96.334				
22	.197	.411	96.745				
23	.185	.386	97.132				
24	.174	.363	97.495				
25	.156	.326	97.821				
26	.142	.295	98.116				
27	.124	.258	98.375				
28	.108	.226	98.601				
29	.088	.184	98.784				
30	.085	.178	98.962				
31	.082	.170	99.132				
32	.068	.141	99.273				
33	.067	.139	99.411				
34	.059	.123	99.534				

(table cont'd.)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
35	.051	.107	99.642				
36	.044	.092	99.734				
37	.033	.068	99.802				
38	.023	.047	99.850				
39	.017	.035	99.885				
40	.015	.031	99.915				
41	.011	.022	99.938				
42	.010	.021	99.959				
43	.009	.019	99.978				
44	.005	.011	99.988				
45	.003	.005	99.994				
46	.002	.004	99.998				
47	.001	.002	100.000				
48	1.995E-5	4.157E-5	100.000				

Extraction method: maximum likelihood

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Common latent factor (CLF) analysis was conducted in SPSS AMOS and the graphical results are shown in Figure 9. Several comparisons of the standardized regression weights from this model to the standardized regression weights without the CLF were found that would cause the researcher to want to retain the CLF or impute composites from the factor scores when creating the structural model. After the review, the common latent factor was left in for several factors; this lowered the loadings because method variance was found amongst the measures. These 26 factors are listed in Figure 7 as having a delta of greater than .20.

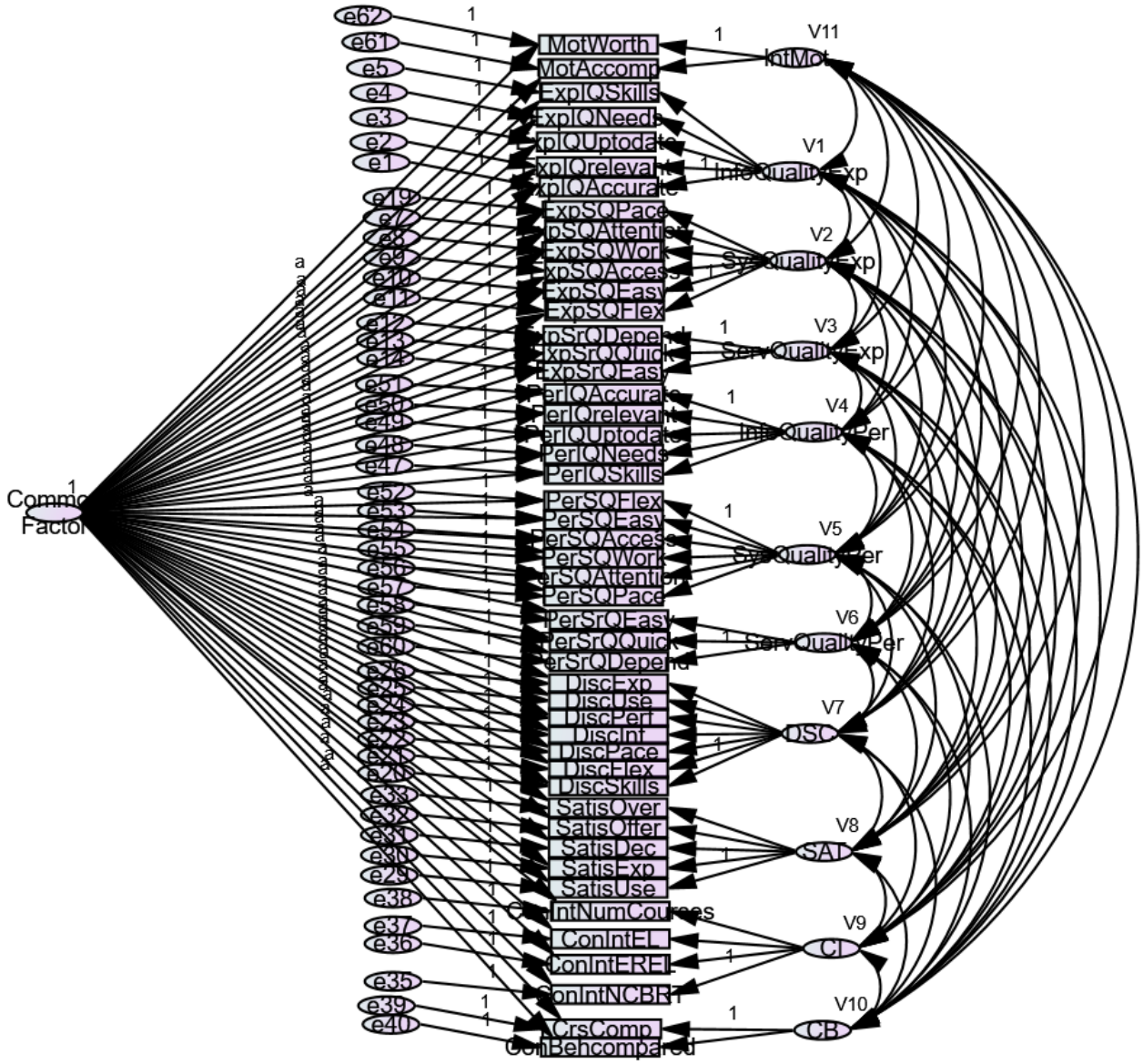


Figure 7. Common latent factor method depicted in AMOS

Table 21. Result Estimates with and without Common Latent Factor (CLF)

Relationship			CLF	NO CLF	Delta
EIQA	<---	InfoQualityExp	0.689	0.905	0.216
EIQR	<---	InfoQualityExp	0.681	0.912	0.231
EIQUTD	<---	InfoQualityExp	0.691	0.9	0.209
EIQN	<---	InfoQualityExp	0.665	0.878	0.213
EIQS	<---	InfoQualityExp	0.691	0.925	0.234
ESyQAt	<---	SysQualityExp	0.615	0.825	0.21
ESyQW	<---	SysQualityExp	0.661	0.904	0.243
ESyQA	<---	SysQualityExp	0.668	0.903	0.235
ESyQE	<---	SysQualityExp	0.67	0.895	0.225
ESyQF	<---	SysQualityExp	0.595	0.828	0.233
ESrQD	<---	ServQualityExp	0.691	0.893	0.202
ESrQQ	<---	ServQualityExp	0.66	0.83	0.17
ESrQE	<---	ServQualityExp	0.772	0.961	0.189
ESyQP	<---	SysQualityExp	0.658	0.904	0.246
PIQA	<---	InfoQualityPer	0.555	0.942	0.387
PIQR	<---	InfoQualityPer	0.539	0.89	0.351
PIQUTD	<---	InfoQualityPer	0.608	0.945	0.337
PIQN	<---	InfoQualityPer	0.527	0.856	0.329
PIQS	<---	InfoQualityPer	0.541	0.894	0.353
PSyQAt	<---	SysQualityPer	0.395	0.724	0.329
PSyQW	<---	SysQualityPer	0.811	0.904	0.093
PSyQA	<---	SysQualityPer	0.71	0.843	0.133
PSyQE	<---	SysQualityPer	0.809	0.876	0.067
PSyQF	<---	SysQualityPer	0.421	0.73	0.309
PSrQD	<---	ServQualityPer	0.642	0.901	0.259
PSrQQ	<---	ServQualityPer	0.731	0.934	0.203
PSrQE	<---	ServQualityPer	0.627	0.69	0.063
PSyQP	<---	SysQualityPer	0.466	0.813	0.347
DS	<---	DSC	0.699	0.856	0.157
DF	<---	DSC	0.714	0.864	0.15
DP	<---	DSC	0.709	0.862	0.153
DI	<---	DSC	0.717	0.867	0.15
DPr	<---	DSC	0.849	0.936	0.087
DU	<---	DSC	0.822	0.922	0.1
DEx	<---	DSC	0.88	0.946	0.066
SU	<---	SAT	0.757	0.935	0.178

(table cont'd.)

Relationship			CLF	NO CLF	Delta
SE	<---	SAT	0.781	0.935	0.154
SD	<---	SAT	0.661	0.877	0.216
SOf	<---	SAT	0.616	0.827	0.211
SOv	<---	SAT	0.718	0.95	0.232
CIN	<---	CI	0.661	0.813	0.152
CIEREL	<---	CI	0.694	0.823	0.129
CIEL	<---	CI	0.724	0.871	0.147
CINC	<---	CI	0.337	0.419	0.082
TotalCoursesCompleted	<---	CB	0.535	0.58	0.045
CBC	<---	CB	0.542	0.631	0.089
MA	<---	IntMot	0.647	0.731	0.084
MW	<---	IntMot	0.61	0.82	0.21

CHAPTER 5. DISCUSSION

This chapter summarizes the study and findings by reporting on the conclusion, implications, limitations, and recommendations that resulted from this study.

5.1 Summary of the Study

This study examined Continuing Professional Development (CPD) eLearning participation and completion by researching adult learners to advance understanding in the relationships among expectations of quality, perceptions of quality, disconfirmation, and satisfaction. This investigation also explored whether learners' motivation moderated the relationship between satisfaction and continuance intention or satisfaction and actual continuance behavior. Data analysis methods included correlation as the statistical technique for the majority of the hypotheses. For the moderation hypotheses, the researcher employed PROCESS, a modeling tool that works in SPSS, to determine if intrinsic motivation moderates the relationship between continuance intention and continuance behavior with satisfaction (Hayes, 2012).

The review of literature centered heavily on the variables of focus in this study. Primary attention was given to the model that was used to test this study's hypotheses. The model integrated theoretical components from the Expectation Disconfirmation Theory (EDT) (Oliver, 1980) and the DeLone and McLean Information Systems Success Model (D&M ISS) (DeLone & McLean, 1992).

This study aimed to realize its objectives by obtaining data from first responders who were participating in CPD eLearning. Before selecting the actual study participants, the researcher conducted a pilot study on learners who registered with the CPD eLearning program in April 2014. Of the 144 learners, only 25 (17%) started the survey while 18 (12.5%) actually completed the survey over a one-week period in February 2015. The actual sample included a nonrandom, purposeful sample of learners who registered in CPD eLearning between May 2014

and October 2014; this sample size was 1,267 learners. The researcher sent postcards and email notifications before emailing the survey link. The selected group of pilot participants were asked to complete a survey, which is how the researcher collected the learners' expectations before the CPD eLearning as well as their perceptions of performance about the CPD eLearning. These questions were specifically about information quality, system quality, and service quality. These three items accounted for overall learning quality expectations and perceptions. Respondents were also asked to determine if their initial thoughts on and feelings about CPD eLearning were confirmed or disconfirmed. Further questions provided information on their satisfaction level as participants. They were also asked for insight on the continuance intention and actual continuance behavior. In other words, they were asked what CPD eLearning they intended to take and what training they actually took.

The researcher also collected measures about participants' motivation. This study intended to look at internal motivation and its effects on continuance intention and continuance behavior with satisfaction. Through this study's instrument, collected data addressed the hypotheses and research intentions posed in the first chapter of this dissertation.

5.2 Summary of Findings

This study's results lead to interesting, yet encouraging, findings and implications for CPD eLearning. This study finds overall support for many of the proposed individual paths. However, the full model analysis uncovers some opportunities for strengthening the model. Appendix G summarizes the results from the hypotheses tests.

Based on these research results, this study finds the following:

- These first responders are educated and appreciate the benefits of CPD eLearning.
- Overall quality of CPD eLearning matters to first responders in CPD eLearning.
- Their expectations affect their perception.
- Disconfirmation is not that well related to expectations, but perceptions are definitely associated.
- These first responders are swayed in their satisfaction depending on their expectations, and ultimately, their perceptions.

The theoretical implications of this study extend the EDT, which adds the element of quality into the expectation and perception constructs. This extension is also evident in this study's continuance behavior measure that supports the hypothesis. This study supports many paths in this model, which leads to satisfaction, continuance intention, and continuance behavior. Finally, the moderation construct finds partial support that leads to the belief that intrinsic motivation should be explored in promoting CPD eLearning to first responders.

This study examined factors that could lead to and determine the success of CPD eLearning when delivered in an asynchronous format. Through the proposed model, this study found that there were significant relationships between several constructs related to CPD eLearning expectations, perceptions, and ultimately, eLearner continuance intentions and behavior when viewed through the correlational analysis lens. The findings showed that, although more work can be done to fine tune, it was helpful to collect data specific to the quality of eLearning so that the data can properly link to satisfaction. Expectations, perceptions, and disconfirmation were found to have an impact on satisfaction. This study concluded that

eLearners are more satisfied when they are less likely to continue their learning and complete courses.

This researcher also explored the relationships between expectations and perceptions of CPD eLearning as they relate to quality of information, service, system, and overall learning. This study found, based on the hypotheses 1a–1d results, that there was a strong positive correlation between expectations of quality and perceptions of quality based on the respondents in this study.

The researcher investigated the expectations and perceptions of quality and their relationship with disconfirmation. Based on the hypotheses 2a–2d results, this study found a strong positive correlation between expectations of quality and disconfirmations based on the respondents in this study. This was contrary to what the researcher hypothesized. Based on the hypotheses 3a–3d results, this study found a strong positive correlation between perceptions of quality and disconfirmation of quality based on the respondents in this study.

Is there a difference between those CPD eLearners who report being satisfied versus those who report being dissatisfied with CPD eLearning? Based on what was found in this study, it seems that learners who are satisfied with CPD eLearning have high expectations about the quality of CPD eLearning. In particular, it seems that having high perceptions of the experience actually might lead to higher satisfaction in CPD eLearning. Although this is counter to what this study expected to find, it is certainly a concept that has piqued interest in further study of this idea. A moderate-to-strong positive relationship between quality expectations and satisfaction was found when hypotheses 4a–4d were tested. A strong positive relationship was found between quality perceptions and satisfaction.

What is the relationship between satisfaction and continuance intention of CPD eLearning? The results of this study indicated that satisfaction has an impact on both the continuance intention as well as the actual continuance behavior of CPD eLearners. Thus, it would seem that highly satisfied learners would want to complete more CPD eLearning and would actually follow through on their intentions.

What is the relationship between satisfaction and continuance of CPD eLearning? The results supported other research and literature in this area; they supported a positive correlation between continuance intention as measured by learners' desire to continue using the CPD eLearning from this study, other emergency response-related CPD eLearning, or any other eLearning as well as the number of courses that the learners intended to complete. The results indicated that more satisfied learners had higher intentions of using CPD and additional eLearning. More specifically, this study measured how many courses the learners completed. This study investigated actual completion behavior and that behavior's relationship with satisfaction. This study supported the positive link in this relationship as well.

Does motivation moderate the relationship between satisfaction and continuance intention? Does motivation moderate the relationship between satisfaction and actual continuance? This study focused on reporting intrinsic motivation and how it moderated the relationship between satisfaction and continuance intention as well as between satisfaction and actual continuance. This study found that only at certain levels does intrinsic motivation moderate these relationships, but not in the direction that the researcher hypothesized. The weakest association between continuance intention and satisfaction occurred in eLearners with low intrinsic motivation. Those with high motivation showed the strongest association. However, the weakest association between continuance behavior and satisfaction occurred in

eLearners with high intrinsic motivation. In this relationship, those with high intrinsic motivation also had the strongest association. Even when intrinsic motivation was high, this study found that if satisfaction was low, continuance behavior was low as well. In contrast, when intrinsic motivation was high and satisfaction was low, continuance intention was high.

The practical implications of this study are many. CPD eLearning program managers, designers, and producers can work with eLearners to ensure that the right quality is present as far as the information, system, and service is concerned to assist in increasing eLearner satisfaction. This approach can increase continuance intention and ultimately can lead to learners completing more courses.

Based on this study, the first responder CPD eLearners are educated and comfortable with CPD eLearning. They base their judgments of CPD eLearning on previously successful interactions with such systems. Thus, it is important to employ best practices and provide high quality content.

Another implication from this data is that first responder CPD eLearners hinge most everything on satisfaction. CPD eLearning program managers, designers, and producers should try to manage expectations and perceptions of quality.

Those involved in providing eLearning courses and programs can use this study's findings to understand the various factors that work to predict which adult learners are more likely to complete workplace eLearning courses. Specifically, implications can be gleaned on how to develop and better manage workplace eLearning courses that are not developed or may not be delivered in house. Additional factors can hint on how to motivate individuals and organizations based on findings from this study.

Although this researcher did not find expectation to be negatively related to disconfirmation as hypothesized, this study did show a moderate positive correlation that might warrant further investigation. Positive perceptions lead to positive disconfirmation whereas negative perceptions lead to negative disconfirmation.

5.3 Contributions to the Literature

This researcher set out to conduct a study in a context not abundantly available in the literature: CPD eLearning in the context of first responders. This study found support for the collection and comparison of quality expectations and perceptions. This study found a strong positive correlation between these variables: the more that was known about what learners expected in terms of information, system, and service quality, the greater the impact on perception. Expectation was also found to be positively correlated with satisfaction. This meant that as expectations increased so do the level of satisfaction and vice versa.

The data in Figure 7 showed that the CPD eLearning Course #13 had the highest reported completion rate where participants completed all parts of the course. One might conclude, based on these results, that eLearners may not wish to complete all courses through to the post-test. Among other ideas, the researcher surmised that participants might access online learning to refresh information that they may already cover in other training, or they may also access the course and not take the exam. It is the exam at the end that triggers completion. CPD eLearning is as a good resource, and adult learners may find themselves looking for particular training and/or information. All learners may not have the goal of course completion.

The data in this study supports this set of hypothesized relationships, expectations and perceptions as expected based on previously cited literature and studies. However, the additional benefit of these items is that they collect expectations and perceptions on information quality,

system quality, and service quality. This allows a more specific view on certain aspects of the eLearning experience and how that eventually affects satisfaction (DeLone & McLean, 2003).

One contribution of this study is that while research maintains focus on the importance of satisfaction (Lankton & McKnight, 2012) from the DeLone and McLean Information System Success Model, this study demonstrates that we must understand specific prior quality expectations and perceptions in order to understand who will enjoy and complete eLearning courses.

One hypothesized set of relationships that the findings in this study did not support was that of expectation and disconfirmation (hypotheses 2a–2d). In contrast, a strong, positive relationship was found, which implies that as expectation increases so should disconfirmation. Whereas the proposed hypotheses and previous research anticipated that an expectation set too high would have a negative effect on disconfirmation, which would make it lower than expectation (Oliver, 1980; 1981). Other studies concluded that expectations should not be lowered to try to achieve a more positive level of disconfirmation (Lankton, McKnight, & Thatcher, 2014). However, inclusion of this path is warranted considering that a definite relationship was found even though it was not as the researcher intended. Further investigation is justified based on the findings in this study.

There are some studies that examine prior exposure to technology (Bhattacherjee, 2001; Bhattacherjee & Premkumar, 2004) as well. In fact, those studies used a separate questionnaire to collect expectations and experience before using the actual questionnaire that collected disconfirmation data after exposure (Lankton, McKnight, & Thatcher, 2014).

The set of hypotheses for perception and disconfirmation, 3a–3d, were supported and were all found to have a strong, positive correlation. If eLearners' perception is more positive,

disconfirmation will travel in that same positive direction (Oliver, 1980; 1981). The eLearners' experience and the eLearning's performance, which turns into their perception, positively influences their disconfirmation. So, with a positive disconfirmation, they will feel that their experience was better than expected, and a negative disconfirmation will have them feeling that their experience was worse than what they expected.

These hypotheses found a moderate, positive relationship between information quality and satisfaction, system quality and satisfaction, service quality and satisfaction, and learning quality and satisfaction. Though not as strong as some of the other findings, a link existed between satisfaction and what the eLearners expected from eLearning. The results indicated that learners' expectations are important for disconfirmation as well as satisfaction.

Since the eLearners are the consumers, it is important to analyze what affects satisfaction as best as possible. Hypotheses 4a–4d as well as 5a–5d supported the notion that both expectation and perception have a positive relationship with satisfaction. Oliver (1980; 1981) proposed the idea of disconfirmation and its tie to satisfaction, and several studies including this one showed a strong, positive relationship between these constructs. More attention should be paid to what the learners expect and what satisfaction means to them. If they do not expect much and do not get much, they may not be motivated to continue or find satisfaction with their learning.

In the area of motivation, this study also looked to see if there was any interaction with satisfaction that ultimately affected continuance intention and continuance behavior. The results did not show a true interaction effect for these hypotheses.

5.4 Limitations of the Study

Limitations of this study are discussed in relation to generalizability purposes. Although the proper steps were taken to ensure content and construct validity (Conway & Lance, 2010),

common method variance is a measurement risk when administering a survey (Campbell & Fiske, 1959). This risk lies in the design of the instrument causing the participants to answer in a certain way and, therefore, creating bias effects. This survey collected self-reports and was delivered to all participants at the same time and in the same way. The researcher reviewed all and partial correlations to address all the common method variance issues. This study took place in a population of learners who were self-selected and voluntary, both as learners in the eLearning program as well as within the study itself. Some eLearning courses are set as required by other agencies, institutions, and organizations. However, the organizations that deliver the eLearning have no actual control over that process. The learning management system (LMS) was used to select the learners for the sample. Based on the parameters selected by the researcher as the focused time for this study, data cleanup was performed on email addresses, mailing addresses, and affiliations. Efforts were made to compare previous learner trends in this particular system and to determine overall similarities in other time periods; even so, those efforts could not prove to be totally generalizable to all other learners who signed up with the eLearning program. The sample was also limited to participants who chose to complete the survey.

This response rate was low despite efforts to encourage and increase the rate. Although Qualtrics provided an excellent opportunity for tracking, and it was easy to send initial and follow-up correspondence to respondents and non-respondents, the system did not always know if potential respondents had accessed or viewed the email request for participation. Many email systems automatically place generic emails and emails labeled a particular way into a junk folder, or they prohibit those emails from reaching the inbox.

Another limitation included inactive email addresses because changes and turnovers were commonplace in the first responder population. Limitations to this approach included the fact that only a few learners might have an email address, but, more importantly, Millar and Dillman (2011) also discussed the fact that learners are now more discerning when receiving electronic survey requests especially since incentives are less likely to be present.

Based on the limitations listed for this study, the use of caution is advised when generalizing the findings of the data. Additionally, the researcher believes more investigation and replication should be conducted to test the new model and validate this study's data.

5.5 Delimitations of the Study

Learners in this study were from the first responder community. The demographic characteristics found should be taken into consideration when reviewing the results as they could have affected the findings. This study focused on learners who enrolled in an eLearning program between May 1, 2014 and October 31, 2014. The researcher reviewed overall frequencies to study general registration patterns, although they did not necessarily provide sufficient evidence or linkage for generalizability.

This study operated under a few assumptions. Those participants who responded answered all of the survey questions honestly and to the best of their ability. The survey instrument had the necessary attributes to determine the users' continuance intention towards, perception of, and their satisfaction with the eLearning system.

5.6 Suggestions for Further Research and Practice

The current research provided interesting contributions to the area of CPD eLearning. It opened the door for additional research and clarification. Specific results based on the analysis of the model and variables in this study also provide a chance to build upon this research. Conducting a mixed methods study that includes a quantitative and qualitative research

component for further insight into some of the data originally collected in this study could be beneficial. A mixed methods study might increase the response rate; comparing data collection performed over the phone versus in person could also affect the response rate. Another opportunity includes a more longitudinal study on the CPD eLearning program to better establish patterns of the first responder community. Further analysis, such as structural equation modeling, can also provide an opportunity to analyze the overarching theoretical model employed in this study (Schumacker & Lomax, 2004). Although there are other powerful tools, the SEM technique provided the opportunity to test multiple relationships at once as well as the entire theory presented in this study (Hair et al., 2010). Structural equation modeling (SEM) can be used for this purpose, which combines factor analysis, multiple regression, and canonical correlation. This type of methodology aims to help in understanding patterns of correlation and covariance such as this study's model (Schumacker & Lomax, 2004). SEM is, however, a large sample, multivariate technique so at least 200 observations would have to be collected to conduct estimation methods and tests of model fit (Kline, 2011).

Based on the relationships found in the model, this study implies that practitioners and developers should monitor and assess information, service, and system quality of CPD eLearning. Since the findings show that there is a direct, moderate to high correlation in these areas, expectation and perception were directly linked to disconfirmation and satisfaction. Learners that are more satisfied tend to continue in CPD eLearning, but also have the motivation to continue in other types of eLearning. Practitioners should also assess the level of internal motivation to determine if there will be a stronger tie between continuance intention and continuance behavior with satisfaction.

Based on the demographics found in this study, more research should be conducted in the first responder community to determine if these characteristics affected the findings. Different programs that are offered to this community could be studied. Additionally, more information about extrinsic motivation and even those that are mandated to this type of CPD eLearning can be compared to get a better understanding of whether or not there is a difference for those with different primary motivators.

5.7 Conclusion

In summary, this study offers implications for policy, theory, and practice and informs future research in the area of CPD eLearning. The researcher developed a model and tested it based on the EDT, where individual paths were measured to determine the strength of the relationships of the variables of focus in this study. What leads to satisfaction and how is that related to continuance intention and behavior? The individual paths supported most of the hypothesized relationships. Although not supported as hypothesized, further investigation of the relationships between expectations of quality and disconfirmation is warranted. Here it was found that adult learners in CPD eLearning with high expectations actually have higher positive confirmation because their initial beliefs are confirmed. In turn, those learners with lower expectations perceived their performance as worse than expected. The researcher advises further investigation to test various types of models that may include or exclude some variables to see if this makes a difference in how continuance should be measured in CPD eLearning and first responders.

This study set out to conduct research in the first responder community and was able to gather almost half of the participation from the law enforcement community. These were all adult learners who registered for CPD eLearning related to first response. Public safety, fire service, and emergency medical services accounted for almost 18% of the respondents. Over

210 respondents from CPD eLearning were used for the analyses. This sample provided the opportunity to gain a better understanding on how these learners' expectations, perceptions, and disconfirmations feed into their satisfaction, continuance intention, and continuance behavior with CPD eLearning. These responses provided information on the motivation behind their CPD eLearning completions and discontinuance. Theoretically, this information provided insight on the model proposed in this study as well. Further research would help gain greater understanding of how the factors involved in this study can evolve.

REFERENCES

AFL-CIO Department for Professional Employees. (2015). *The professional and technical workforce: DPE fact sheet*. Retrieved from http://dpeaflcio.org/programs-publications/issue-fact-sheets/the-professional-and-technical-workforce/

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, and J. Beckmann (Eds.), *Action-control: From cognition to behavior*, 11-39. Heidelberg: Springer.

Ajzen, I., and Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behavior. *Journal of Personality and Social Psychology*, *27*(1), 41-57.

Al-Busaidi, K. A. (2012). Learners' Perspective on Critical Factors to LMS Success in Blended Learning: An Empirical Investigation. *Communications of the Association For Information Systems, 30*, 11-34.

Allen, I. E., and Seaman, J. (2015). *Grade level tracking online education in the United States*: Babson Survey Research Group and Quahog Research Group. Retrieved from http://www.onlinelearningsurvey.com/reports/gradelevel.pdf

Ambient Insight Research (2014). *The 2013-2018 North America self-paced eLearning market* (Executive Overview). Retrieved from http://www.ambientinsight.com/News/PublishedContent.aspx

Ambient Insight Research (2015). *H1 2015 international learning technology investment pattern* (Whitepaper). Retrieved from http://www.ambientinsight.com/News/PublishedContent.aspx

American Society for Training and Development (ASTD). (2012). ASTD 2012 State of the industry report.

American Society for Training and Development (ASTD). (2013). ASTD 2013 State of the industry report.

Aragon, S. R., and Johnson, S. D. (2002). Emerging roles and competencies for training in e-learning environments. *Advances in Developing Human Resources, 4*(4), 424-439.

Baggett, R. (2012). The effectiveness of homeland security training for rural communities: A comparative analysis of web-ased and instructbor-led training delivery. Doctorate Dissertation (Paper 76). Retrieved from http://encompass.eku.edu/cgi/viewcontent.cgi?article=1075&context=etd. Online Theses and Dissertations database

Bartlett, J. E., Kotrlik, J. W., and Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning, and Performance Journal*, *19*(1), 43-50.

Baskett, H., and Marsick, V. J. (1992). Confronting new understandings about professional learning and change. *New Directions for Adult and Continuing Education*, (55), 7-15. doi:10.1002/ace.36719925503

Bhattacherjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. *MIS Quarterly*, *25*(3), 351-370.

Bhattacherjee, A., Perols, J., and Sanford, C. (2008). Information technology continuance: A theoretic extension and empirical test. *The Journal of Computer Information Systems*, *49*(1), 17-26.

Bhattacherjee, A., and Premkumar, G. (2004). Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test. *MIS Quarterly*, *28*(2), 229-254.

Bierema, L. L., and Eraut, M. (2004). Workplace-focused learning: Perspective on continuing professional education and human resource development. *Advances in Developing Human Resources, 6*(1), 52-68.

Caudill, J. and Reeves, B. (2012). The Business of instructional design: Strategies for workplace E-Learning. In T. Bastiaens and G. Marks (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education,* 1423-1427. Chesapeake, VA: AACE.

Campbell, D. T., and Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *56*(2), 81-105. doi:10.1037/h0046016

Carswell, A., and Venkatesh, V. (2002). Learner outcomes in an asynchronous distance education environment. *International Journal of Human-Computer Studies*, *56*(5), 475-494. doi:10.1006/ijhc.1004

Cervero, R. M. (2001). Continuing professional education in transition, 1981–2000. *International Journal of Lifelong Education*, *20*(1/2), 16-30. doi:10.1080/09638280010008282

Cervero, R. M., and Daley, B. J. (2011). Continuing professional education: Multiple stakeholders and agendas. In K. Rubenson (Ed.), *Adult learning and education* (pp. 140–145). Oxford, UK: Elsevier.

Cervero, R. M., and Daley, B. J. (2016). Continuing professional education: A contested space. *New Directions for Adult and Continuing Education*, 151, 9-18. doi:10.1002/ace.20191

Chen, H. J. (2010). Linking employees'e-learning system use to their overall job outcomes: An empirical study based on the IS success model. *Computers & Education*, *55*(4), 1628-1639.

Chen, H., and Kao, C. (2012). Empirical validation of the importance of employees' learning motivation for workplace e-learning in Taiwanese organisations. *Australasian Journal Of Educational Technology*, *28*(4), 580-598.

Chen, N. S., Lin, K. M., and Kinshuk. (2008). Analysing users' satisfaction with e-learning using a negative critical incidents approach. *Innovations in Education and Teaching International*, *45*(2), 115-126. doi: 10.1080/14703290801950286

Cheng, Y.-M. (2014), Extending the expectation-confirmation model with quality and flow to explore nurses' continued blended e-learning intention, *Information Technology & People*, *27*(3), 230-258. doi: 10.1108/ITP-01-2013-0024

Cherrstrom, C. A., Robbins, S. E., and Bixby, J. (2017). 10 years of adult learning. *Adult Learning*, *28*(1), 3-11. doi:10.1177/1045159516664320

Cheung, C. M., and Lee, M. K. (2011). Antecedents and consequences of user satisfaction with an e-learning portal. *International Journal of Digital Society*,*2*(1), 373-380.

Chiu, C. M., Hsu, M. H., Sun, S. Y., Lin, T. C., and Sun, P. C. (2005). Usability, quality, value and e-learning continuance decisions. *Computers & Education*, *45*(4), 399-416. doi:10.1016/j.compedu.2004.06.001

Chiu, C., Sun, S., Sun, P., and Ju, T. L. (2007). An empirical analysis of the antecedents of web-based learning continuance. *Computers & Education*,*49*(4),1224-1245. doi:10.1016/j.compedu.2006.01.010

Chou, H., Lin, I., Woung, L., and Tsai, M. (2012). Engagement in e-Learning opportunities: An empirical study on patient education using expectation confirmation theory. *Journal of Medical Systems*, *36*(3), 1697-1706. doi:10.1007/s10916-010- 9630-9

Churchill Jr, G. A., and Surprenant, C. (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research*, 491-504. doi: 10.2307/3151722

Clark, R. C., and Mayer, R. E. (2003). *e-Learning and the science of instruction; Proven guidelines for consumers and designers of multimedia learning*. San Francisco: Pfeiffer.

Coady, M. (2015). From Houle to Dirkx: Continuing Professional Education (CPE), A crticital state-of-the-field review. *Canadian Journal for the Study of Adult Education*, *27*(3), 27-41.

Cohen, J. (1992). A Power Primer. *Psychological Bulletin*, *112*(1), 155-159.

Collin, K., Van der Heijden, B., and Lewis, P. (2012). Continuing professional development. *International Journal of Training and Development*, *16*(3), 155-163. doi: 10.1111/j.1468-2419.2012.00410.x

Conway, J. M., and Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of Business and Psychology*, (3). 325.

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.)*. Thousand Oaks, CA: Sage.

Creswell, J. W., and Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., and Hanson, W. E. (2003). Advanced mixed methods research designs. In A. Tashakkori and C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 209-240). Thousand Oaks, CA: Sage.

Daley, B. J. (2000). Learning in professional practice. In B. J. Daley and V. W. Mott (Eds.), *Charting a course for continuing professional education: New directions for adult and continuing education*, 86, 33–43. San Francisco: Jossey-Bass.

Daley, B. J. (2002). Continuing professional education: Creating the future. *Adult Learning*, *13*(4), 15-17.

Daley, B. J., and Cervero, R. M. (2016). Learning as the basis for continuing professional education. *New Directions for Adult and Continuing Education*, 151, 19-29. doi: 10.1002/ace.20192

Daley, B. J., and Jeris, L. (2004). Boundary spanning. *Advances in Developing Human Resources*, *6*(1), 5-8.

Daneshgar, F., and Van Toorn, C. (2009). eLearning in the workplace versus eLearning in higher education. *Australian Educational Computing*, *24*(1), 16-22.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-339.

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982-1003.

Deci, E. L., Koestner, R., and Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125*(6), 627-668. doi: http://dx.doi.org/10.1037/0033-2909.125.6.627

Deci, E. L., Koestner, R., and Ryan, R. M. (2001). Extrinsic Rewards and intrinsic motivation in education: Reconsidered once again. *Review of Educational Research, 71*(1), 1-27.

Deci, E. L. and Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum Press.

DeLone, W. H. and McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research, 3*, 60-95. doi:10.1287/isre.3.1.60

DeLone, W. H., and McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems, 19*(4), 9-30.

DeRouin, R. E., Fritzsche, B. A., and Salas, E. (2005). E-learning in organizations. *Journal of Management, 31*(6), 920-940. doi: 10.1177/0149206305279815

Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method (Vol. 2)*. New York: Wiley.

Dirkx, J., and Austin, A. (2002). *A model of theoretical orientations in professional development*. Unpublished figure included in graduate coursework, Michigan State University, Lansing.

Dirkx, J. M., Gilley, J. W., and Maycunich Gilley, A. (2004). Change theory in CPE and HRD:Toward a holistic viewof learning and change inwork. *Advances in Developing Human Resources, 6*(1), 35-51.

Docebo. (2014). *E-Learning market trends & forecast 2014-2016 report: A report by Docebo.* Retrieved December 10, 2014 from https://www.docebo.com/landing/contactform/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf

Dominici, G., and Palumbo, F. (2013). How to build an e-learning product: Factors for student/customer satisfaction. *Business Horizons, 56*(1), 87-96. doi:10.1016/j.bushor.2012.09.011

Donavant, B. W. (2009). The new, modern practice of adult education: Online instruction in a continuing professional education setting. *Adult Education Quarterly, 59*(3), 227-245.

Dubois, C., and Long, L. (2012). Improving the design of workplace e-learning research. *International Journal on E-Learning, 11*(4), 419-440.

Elkhani, N., and Bakri, A. (2012). Review on "Expectancy Disconfirmation Theory" (EDT) model in B2C e-commerce. *Journal of Information Systems Research and Innovation, 2*(12), 95-102.

Eom, S., Ashill, N. J., Arbaugh, J. B., and Stapleton, J. L. (2012). The role of information technology in e-learning systems success. *Human Systems Management, 31*(3/4), 147-163.

Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education, 26*(2), 247-273. doi: 10.1080/158037042000225245

Eschleman, K., and Bowling, N. (2011). A construct validation of the neutral objects satisfaction questionnaire (NOSQ). *Journal of Business and Psychology, 26*(4), 501-515. doi:10.1007/s10869-010-9206-1

Friedman, A. L. (2012). *Continuing Professional Development: Lifelong Learning of Millions.* Routledge, Taylor & Francis Group.

Friedman, A., and Phillips, M. (2004). Continuing professional development: Developing a vision. *Journal of Education and Work, 17*(3), 361. doi:10.1080/1363908042000267432

Gagnon, M. P., Legare, F., Labrecque, M., Fremont, P., Cauchon, M., and Desmartis, M. (2007). Perceived barriers to completing an e-learning program on evidence-based medicine. *Journal of Innovation in Health Informatics, 15*(2), 83-91.

Hamlin, B., and Stewart, J. (2011). What is HRD? A definitional review and synthesis of the HRD domain. *Journal of European Industrial Training, 35*(3), 199-220. doi:10.1108/03090591111120377

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*(4), 408-420.

Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling* [White paper]. Retrieved from http://www.afhayes.com/ public/process2012.pdf

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis.* New York: The Guilford Press.

Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate Behavioral Research, 50*(1), 1-22. doi:10.1080/00273171.2014.962683

Henry, G. T. (1990). *Practical sampling.* Newbury Park, CA: Sage Publications, Inc.

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of Management, 21*(5), 967-988. doi: 10.1177/014920639502100509

Hoberman, S., Mailick, S., and Ebert, R. H. (1994). *Professional education in the United States : experiential learning, issues, and prospects.* Westport, Conn.: Praeger, 1994.

Holton, E. F. (1996). The flawed four-level evaluation model. *Human Resources Development Quarterly*, *7*, 5-15.

Homeland Security Act of 2002, H.R. 5005. Public Law 107-296 C.F.R. (2002). Retrieved from http://thomas.loc.gov/cgi-bin/bdquery/z?d107:hr5005:

Horrigan, J. B. (2016). Pew Research Center. *Lifelong learning and technology.* Retrieved from http://www.pewinternet.org/2016/03/22/lifelong-learning-and-technology/

Hossain, M. A., and Quaddus, M. (2012). Expectation–confirmation theory in information system research: A review and analysis. In *Information systems theory* (pp. 441-469). Springer New York.

Houle, C. O. (1980). *Continuing learning in the professions*. San Francisco, CA: Jossey-Bass Publishers, 1980.

Hsieh, C., Kuo, P., Yang, S., and Lin, S. (2010). Assessing blog-user satisfaction using the expectation and disconfirmation approach. *Computers in Human Behavior*, *26*(6), 1434-1444. doi:10.1016/j.chb.2010.04.022

Hsu, M., Chang, C., Chu, K., and Lee, Y. (2014). Determinants of repurchase intention in online group-buying: The perspectives of DeLone & McLean IS success model and trust. *Computers in Human Behavior*, *36*, 234-245. doi:10.1016/j.chb.2014.03.065

Hsu, M., Yen, C., Chiu, C., and Chang, C. (2006). A longitudinal investigation of continued online shopping behavior: An extension of the theory of planned behavior. *International Journal of Human - Computer Studies*, *64*, 889-904. doi:10.1016/j.ijhcs.2006.04.004

Hsu, C., Yu, C., and Wu, C. (2014). Exploring the continuance intention of social networking websites: an empirical research. *Information Systems and E-Business Management*, *12*(2), 139-163. doi:10.1007/s10257-013-0214-3

Isik, O. (2008). E-learning satisfaction factors. In *Proceedings of the 39th annual meeting of the decision sciences institute*, Baltimore, 941-946.

Jeris, L. H. (2010). Continuing professional education. *Handbook of adult and continuing education*, 275-282.

Jiang, J. J., Klein, G., Parolia, N., and Li, Y. (2012). An analysis of three SERVQUAL variations in measuring information system service quality. *Electronic Journal Information Systems Evaluation Volume*, *15*(2), 149-162.

Jiang, J. J., Klein, G., and Crampton, S. M. (2000). A note on SERVQUAL reliability and validity in information system service quality measurement. *Decision Sciences, 31*(3), 725-744.

Johnson, S. D. and Aragon, S. R. (2003). An instructional strategy framework for online learning environments. *New Directions for Adult and Continuing Education*, 100, 31-43.

Joyce, P., and Cowman, S. (2007). Continuing professional development: investment or expectation?. *Journal of Nursing Management, 15*(6), 626-633. doi:10.1111/j.1365-2834.2007.00683.x

Judge, T. A., and Bretz Jr, R. D. (1993). Report on an alternative measure of affective disposition. *Educational and Psychological Measurement, 53*(4), 1095-1104.

Jun, J. (2005). *Understanding dropout of adult learners in e-learning.* Unpublished doctoral dissertation, University of Georgia, Athens, Georgia, USA.

Jun, J. (2004). Understanding the factors of adult learners dropping out of e-learning courses. In *Proceedings of the 45th annual adult education research conference*, 279-284.

Ke, J. (2010). *Professionals' perceptions of the effectiveness of online versus face-to-face continuing professional education courses* (Doctoral dissertation). Retrieved from http://hdl.handle.net/1969.1/ETD-TAMU-2010-08-8518

Kennedy, A. (2014). Understanding continuing professional development: the need for theory to impact on policy and practice. *Professional Development in Education*, *40*(5), 688. doi:10.1080/19415257.2014.955122

Kim, D. J., Ferrin, D. L., and Rao, H. R. (2009). Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. *Information Systems Research*, *20*(2), 237-257. doi:10.1287/isre.1080.0188

Kirkpatrick, D. L. and Kirkpatrick, J. D. (2007). *Implementing the four levels: A practical guide for effective evaluation of training programs.* San Francisco, CA: Berrett-Koehler Publishers, Inc.

Klein, D. and Ware, M. (2003), E-learning: New opportunities in continuing professional development. *Learned Publishing*, *16*(1), 34–46. doi:10.1087/095315103320995078

Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York, NY: The Guilford Press.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Chicago, IL: Association Press/Follett.

Knowles, M. S., Holton, E. F., and Swanson, R. A. (2005). *The adult learner: The definitive classic in adult education and human resource development (5th ed.)*. Burlington, MA: Elsevier.

Kuchinke, P. (2001).Why HRD is not an academic discipline. *Human Resource Development International*, *4*(3), 291-294. doi: 10.1080/13678860110059357

Lankton, N. and McKnight, D. H. (2012). Examining two expectation disconfirmation theory models: Assimilation and asymmetry effects. *Journal of the Association for Information Systems*, *13*(2), 88-115.

Lankton, N., McKnight, D. H., and Thatcher, J. B. (2014). Incorporating trust-in-technology into expectation disconfirmation theory. *The Journal of Strategic Information Systems*, *23*(2), 128-145.

Lee, M. C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model. *Computers & Education*, *54*(2), 506-516.

Lee, Y., Hsieh, Y., and Hsu, C. (2011). Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems. *Journal of Educational Technology & Society*, *14*(4), 124-137.

Li, J., Brake, G., Champion, A., Fuller, T., Gabel, S., and Hatcher-Busch, L. (2009). Workplace learning: the roles of knowledge accessibility and management. *Journal of Workplace Learning*, *21*(4), 347-364. doi: 10.1108/13665620910954238

Liao, C., Liu, C., Liu, Y., To, P., and Lin, H. (2011). Applying the expectancy disconfirmation and regret theories to online consumer behavior. *Cyberpsychology, Behavior and Social Networking*, *14*(4), 241-246. doi:10.1089/cyber.2009.0236

Liang, J. C., and Wu, S. H. (2010). Nurses' motivations for web-based learning and the role of internet self-efficacy. *Innovations in Education and Teaching International*, *47*(1), 25-37. doi:10.1080/14703290903525820

Lin, C., Tsai, Y., and Chiu, C. (2009). Modeling customer loyalty from an integrative perspective of self-determination theory and expectation-confirmation theory. *Journal of Business and Psychology*, *24*(3), 315-326. Retrieved from http://www.jstor.org.libezp.lib.lsu.edu/stable/27753912

Lin, H. F. (2007). Measuring online learning systems success: Applying the updated DeLone and McLean model. *Cyberpsychology & Behavior*, *10*(6), 817-820. doi: 10.1089/cpb.2007.9948

Lin, K. M. (2011). E-learning continuance intention: Moderating effects of user e-learning experience. *Computers & Education*, *56*(2), 515-526. doi:10.1016/j.compedu.2010.09.017

Lindell, M. K., and Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *The Journal of Applied Psychology*, *86*(1), 114-121. doi:10.1037//0021-9010.86.1.114

Littlejohn, A., and Pegler, C. (2007). *Preparing for blended e-learning*. London: Routledge.

Long, L., Dubois, C., and Faley, R. (2009). A case study analysis of factors that influence attrition rates in voluntary online training programs. *International Journal on E-Learning*, *8*(3), 347-359.

Lowenthal, P. R., Wilson, B., and Parrish, P. (2009). Context matters: A description and typology of the online learning landscape. In M. Simonson (Ed.), *32nd Annual proceedings: Selected research and development papers presented at the annual convention of the Association for Educational Communications and Technology*. Washington D.C.: Association for Educational Communications and Technology.

Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing research*, *35*(6), 382-386.

MacKeracher, D. (2004). *Making sense of adult learning*. Toronto: University of Toronto Press, c2004.

Mansvelt, J., Suddaby, G., O'Hara, D., and Gilbert, A. (2009). Professional development: Assuring quality in e-learning policy and practice. *Quality Assurance in Education: An International Perspective*, *17*(3), 233-249.

Marjanovic, U., Delić, M., and Lalic, B. (2016). Developing a model to assess the success of e-learning systems: Evidence from a manufacturing company in transitional economy. *Information Systems and E-Business Management, 14*(2), 253-272. doi:10.1007/s10257-015-0282-7

McKinney, V., Kanghyun, Y., and Zahedi, F. (2002). The measurement of web-customer satisfaction: An expectation and disconfirmation approach. *Information Systems Research, 13*(3), 296-315.

McWhorter, R. R. (2010). Exploring the emergence of virtual human resource development. *Advances in Developing Human Resources, 12*(6), 623-631. doi: 10.1177/1523422310395367

Merriam, S. B. (2008). Adult learning theory for the twenty-first century. *New Directions For Adult & Continuing Education, 2008*(119), 93-98. doi:10.1002/ace.309

Merriam, S. B., and Brockett, R. G. (2011). *The profession and practice of adult education: An introduction.* John Wiley & Sons.

Merriam, S. B., Caffarella, R. S., and Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide*. John Wiley & Sons.

Millar, M. M., and Dillman, D. A. (2011). Improving response to web and mixed-mode surveys. *Public Opinion Quarterly*, *75*(2), 249-269. doi:10.1093/poq/nfr003

Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. *Computers in Human Behavior*, *45*, 359-374.

Moore, J. L., Dickson-Deane, C., and Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education*, *14*(2), 129-135. doi: 10.1016/j.iheduc.2010.10.001

Mott, V. W. (2000). The development of professional expertise in the workplace. In B. J. Daley and V. W. Mott (Eds.), *Charting a course for continuing professional education*. *New directions for adult and continuing education*, *86*, 23–31. San Francisco: Jossey- Bass.

Myers, S. (2013). Continuing Education. *Research Starters: Education*. Retrieved September 30, 2015, from EBSCO Online Database Education Research Complete.

National Consortium for the Study of Terrorism and Responses to Terrorism (START). (2012). *Global Terrorism Database* [Data file]. Retrieved from http://www.start.umd.edu/gtd

National Domestic Preparedness Consortium (NDPC), 6 U.S.C. §1102. (2010). Retrieved from http://www.gpo.gov/fdsys/pkg/USCODE-2010-title6/html/USCODE-2010-title6-chap4-subchapI-sec1102.htm

National Domestic Preparedness Consortium (2010). *National Domestic Preparedness Consortium Past, Present, and Future*. Retrieved from: http://www.ndpc.us/pdf/NDPC_Legacy091010_Final_LRez.pdf

National Intelligence Council. (2012, December). *Global trends 2013: Alternative world (NIC 2012-001)*. Washington, DC:

National Training and Education Division (NTED). (n.d.). Retrieved from https://www.firstrespondertraining.gov/frt/content.do?page=serve

National Training and Education Division (NTED) Responder Training Development Center. (n.d.). Retrieved from https://www.firstrespondertraining.gov/rtdc/state/main.htm

Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.

O'Connor, C., Sceiford, E., Wang, G., Foucar-Szocki, D., and Griffin, O. (2003). Departure, abandonment, and dropout of e-learning: Dilemma and solutions. In *TechLearn 2003 Conference*.

OECD (2012), *Better Skills, Better Jobs, Better Lives: A Strategic Approach to Skills Policies*, OECD Publishing, Paris. doi: http://dx.doi.org/10.1787/9789264177338-en

Oliver, R. L. (1977). Effect of expectation and disconfirmation on postexposure product evaluations: An alternative interpretation. *Journal of Applied Psychology, 62*(4), 480-486.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 460-469.

Oliver, R. L. (1981). Measurement and evaluation of satisfaction processes in retail settings. *Journal of Retailing*, *57*(3), 25-48.

Oliver, R. L. (2014). *Satisfaction: A behavioral perspective on the consumer.* Routledge.

Oliver, R. L., and Bearden, W. O. (1983). The role of involvement in satisfaction processes. In R. Bagozzi and A. Tybout (Eds.), *Advances In Consumer Research*, *10*(1), 250-255. Ann Arbor, MI: Association for Consumer Research.

Padilla Rodriguez, B. C., Rodriguez Nieto, M. C., and Padilla Montemayor, V.M. (2009). Evaluating e-learning effectiveness using Kirkpatrick's four-level model. In G. Siemens and C. Fulford (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2009*, 3341-3346. Chesapeake, VA: AACE.

Paechter, M., Maier, B., and Macher, D. (2010). Students' expectations of, and experiences in e-learning: Their relation to learning achievements and course satisfaction. *Computers & Education*, *54*, 222-229. doi:10.1016/j.compedu.2009.08.005

Parasuraman, A. A., Zeithaml, V. A., and Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, *49*(4), 41-50.

Parasuraman, A. A., Zeithaml, V. A., and Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, *64*(1), 12-40.

Park, J.-H., and Choi, H. J. (2009). Factors influencing adult learners' decision to drop out or persist in online learning. *Educational Technology & Society, 12*(4), 207-217.

Park, Y., and Jacobs, R. L. (2011). The influence of investment in workplace learning on learning outcomes and organizational performance. *Human Resource Development Quarterly*, *22*(4), 437-458.

Pereira, F. A. D. M., Ramos, A. S. M., Andrade, A. P. V. D., and Oliveira, B. M. K. D (2015). Use of virtual learning environments: A theoretical model using decomposed expectancy disconfirmation theory. *JISTEM - Journal of Information Systems and Technology Management*, *12*(2), 333-350. doi: https://dx.doi.org/10.4301/S1807-17752015000200008

Phillips, J. J., and Stone, R. D. (2002). *How to measure training results: A practical guide to tracking the six key indicators.* New York: McGraw-Hill.

Phillips, R., McNaught, C., and Kennedy, G. (2011). *Evaluating e-Learning: Guiding research and practice. Connecting with e-Learning*. Routledge, Taylor & Francis Group.

Pitt, L. F., Watson, R. T., and Kavan, C. (1995). Service quality: A measure of information systems effectiveness. *MIS Quarterly*, *19*(2), 173-187.

Polit, D. F., and Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing and Health*, *29*(5), 489-497.

Polit, D. F., Beck, C. T., and Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, *30*(4), 459-467.

Pool, I. A., Poell, R. F., Berings, M. C., and ten Cate, O. (2016). Motives and activities for continuing professional development: An exploration of their relationships by integrating literature and interview data. *Nurse Education Today*, *38*, 22-28. doi:10.1016/j.nedt.2016.01.004

Podsakoff, P. M., MacKenzie, S. B., Lee, J., and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, *88*(5), 879-903. doi:10.1037/0021-9010.88.5.879

Premkumar, G. G., and Bhattacherjee, A. (2008). Explaining information technology usage: A test of competing models. *Omega*, *36*(1), 64-75. doi:10.1016/j.omega.2005.12.002

Punch, K.F. (2003). *Survey research: The basics.* Thousand Oaks, CA: Sage.

Rachal, J. R. (2002). Andragogy's detectives: A critique of the present and a proposal for the future. *Adult Education Quarterly*, *52*(3), 210-27.

Rey Moreno, M., Rufín Moreno, R., and Medina Molina, C. (2013). Generating satisfaction towards e-learning platforms. *Management Decision*, *51*(7), 1543-1558.

Rhoda, K. I. (2005). The role of distance education in enhancing accessibility for adult learners. In L. Bash (Ed.), *Best practice in adult learning*, 149-172. Bolton, MA: Ankar Publishing Company, Inc.

Roca, J. C., Chiu, C. M., and Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the technology acceptance model. *International Journal of Human-Computer Studies*, *64*(8), 683-696. doi:10.1016/j.ijhcs.2006.01.003

Rosenberg, M. J. (2001). *E-learning: Strategies for Delivering Knowledge in the Digital Age.* New York: McGraw-Hill.

Ross, K., Barr, J., and Stevens, J. (2013). Mandatory continuing professional development requirements: what does this mean for Australian nurses. *BMC Nursing*, *12*9. doi:10.1186/1472-6955-12-9

Roth, G. L. (2004). CPE and HRD: Research and practice within systems and across boundaries. *Advances in Developing Human Resources*, *6*(1), 9-19.

Rothwell, A., and Arnold, J. (2005). How HR professionals rate 'continuing professional development'. *Human Resource Management Journal*, *15*(3), 18-32.

Rubio, D. M., Berg-Weger, M., Tebb, S. S., Lee, E. S., and Rauch, S. (2003). Objectifying content validity: Conducting a content validity study in social work research. *Social Work Research*, *27*(2), 94-104.

Russ-Eft, D. F. (2016). Controversies that shaped the field of human resource development: Town hall forums of the Academy of Human Resource Development. *Advances in Developing Human Resources*, *18*(4), 512-535. doi: 10.1177/1523422316660148

Russ-Eft, D., Watkins, K. E., Marsick, V. J., Jacobs, R. L., and McLean, G. N. (2014). What Do the Next 25 Years Hold for HRD Research in Areas of Our Interest? *Human Resource Development Quarterly*, *25*(1), 5-27. doi:10.1002/hrdq.21180

Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78. doi: http://dx.doi.org/10.1037/0003-066X.55.1.68

Saadé, R. G., Nebebe, F., and Mak, T. (2009). The role of intrinsic motivation in system adoption: A cross-cultural perspective. *Journal of Information, Information Technology, and Organizations*, *4*(2009), 107-126.

Schwarz, C. (2011). *Understanding the role of expectation disconfirmation theory on IT outsourcing success.* (Doctoral Dissertations). Retrieved from http://digitalcommons.lsu.edu/gradschool_dissertations/3282.

Schumacker, R. E., and Lomax, R. G. (2004). *A beginner's guide to structural equation modeling*. Psychology Press.

Sitzmann, T., Ely, K., Bell, B. S., and Bauer, K. N. (2010). The effects of technical difficulties on learning and attrition during online training. *Journal of Experimental Psychology: Applied*, *16*(3), 281-292. doi:10.1037/a0019968

Sleezer, C. M., Conti, G. J., and Nolan, R. E. (2004). Comparing CPE and HRD programs: Definitions, theoretical foundations, outcomes, and measures of quality. *Advances in Developing Human Resources*, *6*(1), 20-34.

Slotte, V., and Herbert, A. (2006). Putting professional development online: integrating learning as productive activity. *Journal of Workplace Learning*, *18*(4), 235-247.

Soper, D.S. (2015). *A-priori sample size calculator for structural equation models* [Software]. Retrieved from http://www.danielsoper.com/statcalc

Spreng, R. A., MacKenzie, S. B., and Olshavsky, R. W. (1996). A reexamination of the determinants of consumer satisfaction. *The Journal of Marketing*, 15-32. doi: 10.2307/1251839

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., and Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, *50*(4), 1183-1202.

Swanson, R. A. (2001). Human resource development and its underlying theory. *Human Resource Development International*, *4*(3), 299-312.

Taber, N. (2008). Emergency response: Elearning for paramedics and firefighters. *Simulation & Gaming*, *39*(4), 515-527.

Taipjutorus, W., Hansen, S., and Brown, M. (2012). Investigating a relationship between learner control and self-efficacy in an online learning environment. *Journal of Open, Flexible and Distance Learning*, *16*(1), 56.

Teddlie, C. and Tashakkori, A. (2009). Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences. Thousand Oaks, CA: Sage Publications Inc.

Teo, T. S., Lim, V. K., and Lai, R. Y. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega*, *27*(1), 25-37.

Tse, D. K., Nicosia, F. M., and Wilton, P. C. (1990). Consumer Satisfaction as a Process. *Psychology & Marketing*, *7*(3), 177.

Tse, D., and Wilton, P. (1988). Models of consumer satisfaction formation: An extension. *Journal of Marketing Research, 25*(2), 204-212. doi:10.2307/3172652

Udo, G. J., Bagchi, K. K., and Kirs, P. J. (2011). Using SERVQUAL to assess the quality of e-learning experience. *Computers in Human Behavior, 27*(3), 1272-1283.

Umble, K. E., and Dooley, L. M. (2004). Planning human resource development and continuing professional education programs that use educational technologies: Voices that must be heard. *Advances in Developing Human Resources, 6*(1), 86-100.

U.S. Department of Education. Institute of Education Sciences, *National Center for Education Statistics.* Retrieved from http://nces.ed.gov/

U.S. Department of Homeland Security. *DHS Budget*. Retrieved from http://www.dhs.gov/publication/dhs-budget

U.S. Department of Labor, Bureau of Labor Statistics. (2015). *Occupational Outlook Handbook, 2016-17 Edition, Police and Detectives.* Retrieved from http://www.bls.gov/ooh/protective-service/police-and-detectives.htm

Venkatesh, V., and Goyal, S. (2010). Expectation disconfirmation and technology adoption: Polynomial modeling and response surface analysis. *MIS Quarterly, 34*(2), 281-303.

Venkatesh, V., Thong, J. L., Chan, F. Y., Hu, P. J., and Brown, S. A. (2011). Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context. *Information Systems Journal, 21*(6), 527-555. doi:10.1111/j.1365-2575.2011.00373.x

Waight, C., and Stewart, B. (2009). Exploring corporate e-learning research: What are the opportunities? *Impact: Journal of Applied Research in Workplace E-learning, 1*(1), 68–79.

Wang, G. G. (2010). Theorizing e-learning participation: A study of the HRD online communities in the USA. *Journal of European Industrial Training, 34*(4), 344-364.

Wang, M., Ran, W., Liao, J., and Yang, S. H. (2010). A performance-oriented approach to e-learning in the workplace. *Journal of Educational Technology & Society, 13*(4), 167-179.

Wang, Y., Wang, H., and Shee, D. Y. (2007). Measuring e-learning systems success in an organizational context: Scale development and validation. *Computers in Human Behavior, 23*(4), 1792-1808.

Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of Educational Research, 79*(2), 702-739. doi:10.3102/0034654308330970

Weitz, J. (1952). A neglected concept in the study of job satisfaction. *Personnel Psychology*, *5*(3), 201. doi:10.1111/j.1744-6570.1952.tb01012.x

Wetta-Hall, R., Fredrickson, D. D., Ablah, E., Cook, D. J., and Molgaard, C. A. (2006). Knowing who your partners are: terrorism-preparedness training for nurses. *Journal of Continuing Education in Nursing*, *37*(3), 106-112.

Who Do We Serve? (2016). Retrieved March 22, 2017, from https://www.firstrespondertraining.gov/frt/content.do?page=serve

Wolf, E. J., Harrington, K. M., Clark, S. L., and Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, *73*(6), 913-934. doi:10.1177/0013164413495237

Wong, W., and Huang, N. N. (2011). The effects of e-learning system service quality and users' acceptance on organizational learning. *International Journal of Business and Information*, *6*(2), 205-225.

Yoo, S.J., Han, S.H., and Huang, W.B. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace: A case from South Korea. *Computers in Human Behavior*, *28(3),*942-950. doi:10.1016/j.chb.2011.12.015

APPENDIX A. PRE-NOTIFICATION POSTCARD

DATE HERE

LEARNER NAME HERE
ADDRESS HERE
EMAIL ADDRESS HERE

In a few days, you will receive an email request to fill out a brief questionnaire for an important research project being conducted by Louisiana State University School of Human Resource Education and Workforce Development.

It concerns the satisfaction and continuance of learners who have registered for XXXXX eLearning.

I am writing in advance because we have found that many people like to know ahead of time that they will be contacted. The study is an important one that will help governmental agencies as well as citizens in the United States by providing a systematic evaluation of learners that register in XXXXX eLearning which will help to understand if expectations are being met.

Thank you for your time and consideration. It's only with the generous help of people like you that our research can be successful.

Sincerely,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Tracey Rizzuto
Associate Director, School of Human Resource Education and Workforce Development
Mary Ethel Baxter Lipscomb Memorial Endowed Professor of Human Resource, Leadership, and Organization Development
trizzut@lsu.edu

P.S. Please find enclosed a small token of appreciation as a way of saying thanks.

APPENDIX B. SURVEY EMAIL COVER LETTER

Subject Line: Complete Emergency Response Training Survey

Good morning, ${m://FirstName} ${m://LastName},

We need your help with an important survey, even if you did NOT complete any courses.

- Takes **~15 minutes to complete.**
- Complete to **win an eGift card of up to $100 (QUALIFY FOR $100 eGift card IF COMPLETED THIS WEEK).**

You have registered with XXXXX (name and website information omitted) eLearning in the last year and this will help to better understand the role of satisfaction in learners continuing with and completing eLearning.

Please spend a few minutes sharing some of your expectations, motivations, and experiences in XXXXX eLearning.

It is easy, follow link to survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

The survey is confidential. Your individual answers will not be linked with your name or organization in any reports of the data. Your participation is voluntary.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

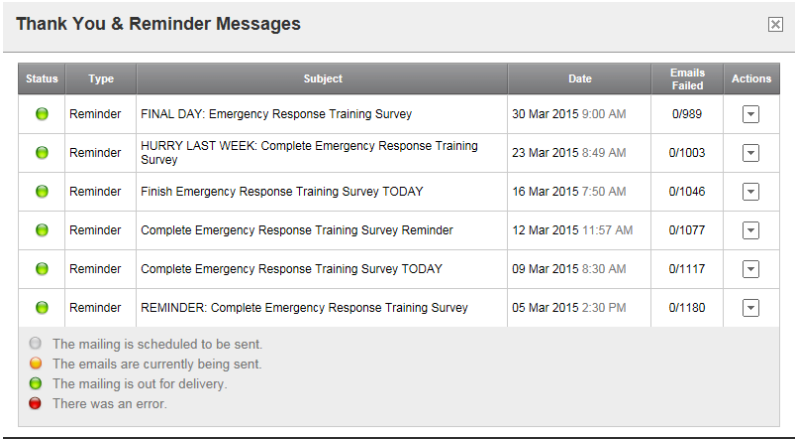
We very much appreciate your help with this study.

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

APPENDIX C. FOLLOW-UP SURVEY EMAILS



Thank You & Reminder Messages

Status	Type	Subject	Date	Emails Failed	Actions
	Reminder	FINAL DAY: Emergency Response Training Survey	30 Mar 2015 9:00 AM	0/989	
	Reminder	HURRY LAST WEEK: Complete Emergency Response Training Survey	23 Mar 2015 8:49 AM	0/1003	
	Reminder	Finish Emergency Response Training Survey TODAY	16 Mar 2015 7:50 AM	0/1046	
	Reminder	Complete Emergency Response Training Survey Reminder	12 Mar 2015 11:57 AM	0/1077	
	Reminder	Complete Emergency Response Training Survey TODAY	09 Mar 2015 8:30 AM	0/1117	
	Reminder	REMINDER: Complete Emergency Response Training Survey	05 Mar 2015 2:30 PM	0/1180	

The mailing is scheduled to be sent.
The emails are currently being sent.
The mailing is out for delivery.
There was an error.

Subject Line: REMINDER: Complete Emergency Response Training Survey

First Actual Reminder

Good afternoon, ${m://FirstName} ${m://LastName},

A few others have responded, but we would still love to hear from you.
We need your help with this important survey even if you did NOT complete any courses.

- Takes ~**15 minutes to complete.**
- Complete **by Monday** afternoon to qualify for **one of two $100** eGift cards.

You have registered with XXXXX (name and website information omitted) eLearning in the last year and this will help to better understand the role of satisfaction in learners that register, continue with, and complete eLearning.

Please spend a few minutes sharing some of your online learning expectations, motivations, and experiences.

It is easy, follow link to survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

The survey is confidential. Your individual answers will not be linked with your name or organization in any reports of the data. Your participation is voluntary.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

We very much appreciate your help with this study.

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

Subject Line: Complete Emergency Response Training Survey TODAY

Second Actual Reminder

Good morning, ${m://FirstName} ${m://LastName},

If you have started, make sure that you complete the survey by 4:30 PM CST to qualify for the $100 gift card drawings. Any received after 4:30 PM today will qualify for the $75 gift card drawings.

We still need your help with this important survey even if you did NOT complete any courses.

PLEASE LET US KNOW IF YOU WOULD RATHER A PAPER SURVEY.

- Takes ~**15 minutes to complete.**
- Complete **by Monday** afternoon to qualify for **one of two $100** eGift cards.

You have registered with XXXXX (name and website information omitted) eLearning in the last year and this will help to better understand the role of satisfaction in learners that register, continue with, and complete eLearning.

Please spend a few minutes sharing some of your online learning expectations, motivations, and experiences.

It is easy, follow link to survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

The survey is confidential. Your individual answers will not be linked with your name or organization in any reports of the data. Your participation is voluntary.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

We very much appreciate your help with this study.

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

Subject Line: Complete Emergency Response Training Survey Reminder

Third Actual Reminder

Good afternoon, ${m://FirstName} ${m://LastName},

Some of your colleagues have responded, but we would still love to hear from you.

Congratulations to Louis S. from Humble, TX and Gary V. from Talladega, AL for winning the two $100 eGift cards.

We need your help with this important survey even if you did NOT complete any courses.

- Takes ~**15 minutes to complete.**
- Complete **by Monday** afternoon to qualify for **one of two $75** eGift cards.

You have registered with XXXXX (name and website information omitted) eLearning in the last year and this will help to better understand the role of satisfaction in learners that register, continue with, and complete eLearning.

Please spend a few minutes sharing some of your online learning expectations, motivations, and experiences.

It is easy, follow link to survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

The survey is confidential. Your individual answers will not be linked with your name or organization in any reports of the data. Your participation is voluntary.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

We very much appreciate your help with this study.

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

Subject Line: Finish Emergency Response Training Survey TODAY

Fourth Actual Reminder

Good morning, ${m://FirstName} ${m://LastName},

You are receiving this message because you have either not started or not completed the survey.

Make sure that you complete the survey by 4:30 PM CST to qualify for this week's $75 gift card drawings. Any received after 4:30 PM today will qualify for the $50 gift card drawings.

Please complete even if you did NOT complete any courses.

PLEASE LET US KNOW IF YOU WOULD RATHER A PAPER SURVEY.

- Takes ~**15 minutes to complete.**
- Complete **by Monday** afternoon to qualify for **one of two $75** gift cards.

You have registered with XXXXX (name and website information omitted) eLearning in the last year and this will help to better understand the role of satisfaction in learners that register, continue with, and complete eLearning.

Please spend a few minutes sharing some of your online learning expectations, motivations, and experiences.

Take the survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

The survey is confidential. Your individual answers will not be linked with your name or organization in any reports of the data. Your participation is voluntary.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

We very much appreciate your help with this study.

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

Subject Line: HURRY LAST WEEK: Complete Emergency Response Training Survey

Fifth Actual Reminder

Good morning, ${m://FirstName} ${m://LastName},

This is our last full week of our survey. Several of your colleagues have responded, but we would still love to hear from you.

Congratulations to Lionel L. from Ploesti, PR and Vivian B. from Oklahoma City, OK for winning the two $75 gift cards.

We need your help with this important survey even if you did NOT complete any courses.
****You are receiving this message either because you have not started or have not completed your survey.****

- Takes ~**15 minutes to complete.**
- Complete **by TODAY before 4:30 PM CST** to qualify for **one of two $50** gift cards.
  If you complete by next Monday afternoon, you will qualify for one of two $25 gift cards.

You have registered with XXXXX (name and website information omitted) eLearning in the last year and this will help to better understand the role of satisfaction in learners that register, continue with, and complete eLearning.

Please spend a few minutes sharing some of your online learning expectations, motivations, and experiences.

Follow this link to survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

The survey is confidential. Your individual answers will not be linked with your name or organization in any reports of the data. Your participation is voluntary.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

We very much appreciate your help with this study.

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

Subject Line: FINAL DAY: Emergency Response Training Survey

Final Actual Reminder

Good morning, ${m://FirstName} ${m://LastName},

Having worked at the XXXXX for over 10 years, I truly value what you do and the great value that you place on your training. I have enjoyed working with the varied types of professionals interested in emergency response training.

During the last few weeks, we have sent you several mailings about an important research study we are conducting.

Its purpose is to help in understanding how satisfaction is related to continuance and completions of eLearning. This will not only further the research but will also help organizations like the XXXXX (name and website information omitted) and those that offer eLearning continued professional development. We invite you to stay tuned to the XXXXX (name and website information omitted) for more information on the results from this study.

This study is drawing to a close today, and we believe that hearing from everyone in this selected group will help assure that the survey results are as accurate as possible.

We also want to assure you that your response to this study is voluntary, and if you prefer not to respond, that is fine.

Finally, we appreciate your willingness to consider our request as we conclude this effort to better understand the relationship between satisfaction, motivation, and completion of eLearning. We do apologize if at any time you felt inconvenienced with the email requests or this survey, but we do appreciate your attention.

Should you have any questions or comments please contact me, Susana R. Lee, or Dr. Tracey Rizzuto (trizzut@lsu.edu).

This survey will close this afternoon.
Follow this link to survey:
${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:
${l://SurveyURL}

Many thanks,

Susana R. Lee, M.S.
Doctoral Candidate
sjrlee@lsu.edu

Follow the link to opt out of future emails:
${l://OptOutLink?d=Click here to unsubscribe}

APPENDIX D. POWER CALCULATOR RESULTS

Please enter the necessary parameter values, and then click 'Calculate'.

Anticipated effect size:	0.1
Desired statistical power level:	0.8
Number of latent variables:	13
Number of observed variables:	48
Probability level:	0.05

Calculate!

Minimum sample size to detect effect: 2,176
Minimum sample size for model structure: 121
Recommended minimum sample size: 2,176

Please enter the necessary parameter values, and then click 'Calculate'.

Anticipated effect size:	0.3
Desired statistical power level:	0.8
Number of latent variables:	13
Number of observed variables:	48
Probability level:	0.05

Calculate!

Minimum sample size to detect effect: 204
Minimum sample size for model structure: 121
Recommended minimum sample size: 204

Please enter the necessary parameter values, and then click 'Calculate'.

Anticipated effect size:	0.5
Desired statistical power level:	0.8
Number of latent variables:	13
Number of observed variables:	48
Probability level:	0.05

Calculate!

Minimum sample size to detect effect: 50
Minimum sample size for model structure: 121
Recommended minimum sample size: 121

APPENDIX E. IRB APPROVAL

130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

TO: Susana Lee
Human Resource Education

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: January 16, 2015

RE: IRB# E9143

TITLE: Investigating eLearning Continuance through the Expectation Disconfirmation Theory

New Protocol/Modification/Continuation: New Protocol

Review Date: 1/15/2015

Approved X **Disapproved** _____

Approval Date: 1/15/2015 **Approval Expiration Date:** 1/14/2018

Exemption Category/Paragraph: 2a

Signed Consent Waived?: Yes

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable): _____

Protocol Matches Scope of Work in Grant proposal: (if applicable) _____

By: Dennis Landin, Chairman _____

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE:**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.lsu.edu/irb*

APPENDIX F. RESEARCH OBJECTIVES AND QUESTIONS

This research set out to empirically test and address the following.

- The learning and development industry uses a misspecified model. To date, few studies have included the measure of quality (DeLone and McLean, 2003) in the expectation, perception, and disconfirmation constructs.
- What are the relationships between expectations and perceptions of CPD eLearning as they relate to the quality of information, service, system, and overall learning?
- In what way do expectations and perceptions of quality relate to disconfirmation?
- To propose a theory that better explains the actual link between satisfaction and continuance. By not including the constructs of motivation and actual continuance behavior, the research model may not fully describe relationships and results that may be associated with CPD eLearning continuance intention.
- Is there a difference between those CPD eLearners who report satisfaction versus those who are dissatisfied with CPD eLearning?
- What is the relationship between satisfaction and continuance intention of CPD eLearning?
- What is the relationship between satisfaction and continuance of CPD eLearning?
- Does motivation moderate the relationship between satisfaction and continuance intention?
- Does motivation moderate the relationship between satisfaction and actual continuance?

APPENDIX G. HYPOTHESES TESTING TABLE

Table 22. Synopsis of Hypotheses and Findings

Hypothesis	Statistical Result	Hypothesis Result
H1a: Information quality expectation is positively related to perception.	Strong Positive Correlation—.597	Supported
H1b: Service quality expectation is positively related to perception.	Strong Positive Correlation— .560	Supported
H1c: System quality expectation is positively related to perception.	Strong Positive Correlation—.482	Supported
H1d: Learning quality expectation is positively related to perception.	Strong Positive Correlation—.583	Supported
H2a: Information quality expectation is negatively related to disconfirmation.	Moderate Positive Correlation—.392	Not Supported
H2b: Service quality expectation is negatively related to disconfirmation.	Moderate Positive Correlation—.385	Not Supported
H2c: System quality expectation is negatively related to disconfirmation.	Strong Positive Correlation—.403	Not Supported
H2d: Learning quality expectation is negatively related to disconfirmation.	Strong Positive Correlation—.435	Not Supported
H3a: Information quality perception is positively related to disconfirmation.	Strong Positive Correlation—.573	Supported
H3b: Service quality perception is positively related to disconfirmation.	Strong Positive Correlation—.596	Supported
H3c: System quality perception is positively related to disconfirmation.	Strong Positive Correlation—.652	Supported
H3d: Learning quality perception is positively related to disconfirmation.	Strong Positive Correlation—.674	Supported
H4a: Information quality expectation is positively related to satisfaction.	Strong Positive Correlation—.452	Supported
H4b: Service quality expectation is positively related to satisfaction.	Moderate Positive Correlation—.366	Supported
H4c: System quality expectation is positively related to satisfaction.	Moderate Positive Correlation—.393	Supported
H4d: Learning quality expectation is positively related to satisfaction.	Strong Positive Correlation—.441	Supported

(table cont'd.)

Hypothesis	Statistical Result	Hypothesis Result
H5a: Information quality perception is positively related to satisfaction.	Strong Positive Correlation—.670	Supported
H5b: Service quality perception is positively related to satisfaction.	Strong Positive Correlation—.693	Supported
H5c: System quality perception is positively related to satisfaction.	Strong Positive Correlation—.682	Supported
H5d: Learning quality perception is positively related to satisfaction.	Strong Positive Correlation—.745	Supported
H6: Disconfirmation is positively related to satisfaction.	Strong Positive Correlation—.666	Supported
H7: Satisfaction is positively related to continuance intention.	Strong Positive Correlation—.541	Supported
H8: Satisfaction is positively related to continuance behavior.	Weak Positive Correlation—.266 (Courses Completed)	Supported
H9: Continuance intention is positively related to continuance behavior.	Weak Positive Correlation—.145 (Courses Completed)	Supported
H10: Intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship between satisfaction and continuance intention.		Partially Supported
H11: Intrinsic motivation positively interacts with satisfaction to strengthen the positive relationship satisfaction and continuance behavior.		Partially Supported

APPENDIX H. RESEARCH INSTRUMENT

LSU | College of Human Sciences & Education
School of Human Resource Education & Workforce Development

Welcome Page

${m://FirstName}

We are glad you are here!

Because of your registration and participation in the NCBRT eLearning in the last few months you have been included in our lucky list of initial survey participants.

We would like to know about your initial expectations and experience with NCBRT eLearning: the system (online), the information (content), and the service (any help or support). We would also like to know what you did in NCBRT eLearning: what you intended to complete and what you completed. It is fine if you didn't complete anything...we have a place for that too.

Please continue to the next page to review and accept the

https://lsu.qualtrics.com/ControlPanel/Ajax.php?action=GetSurveyPrintPreview&T=5LTR... 9/9/2015

informed consent.

Thanks again for being here...and good luck on the eGift card drawings!

Informed Consent Form

Informed Consent Form
eLearning Satisfaction and Success Survey

1. **Study Title:** Investigating eLearning Continuance Through the Expectation Disconfirmation Theory

2. **Performance Site:** Louisiana State University and Agricultural and Mechanical College

3. **Investigators:** The following investigators are available for questions about this study, M-F, 8:00 a.m. - 4:30 p.m.
Busana Lee, 225-803-1158; Dr. Tracey Rizzuto, 225-578-2453
*Please notify us if you would rather receive a paper survey.

4. **Purpose of the Study:** This study is designed to learn about eLearners' expectations, perceptions, and satisfaction with eLearning. This information will then be used to determine if there is a relationship between intended completions and actual completions. In addition, this research will also look at the role that motivation plays between satisfaction and continuance.

5. **Subject Inclusion:** Learners that registered with NCBRT eLearning (http://www.ncbrt.lsu.edu/elearning) between May 1, 2014 and October 31, 2014 will be included in the sample for this study. Test subjects included those registered in April 2014.

6. **Number of subjects:** Approximately 1300 subjects will be invited to participate.

7. **Study Procedures:** Each subject will receive a notification via mail and a subsequent email about the survey. The subject will then select the survey link which will take the subject to a consent form. Once the subject agrees to take the survey, it should take about 15 minutes for the subject to complete the survey. The questions will be about expectations, perceptions, satisfaction, intention, and completion as it relates to eLearning. Some demographic information will also be collected.

8. **Benefits:** Subjects will be entered into a drawing for Visa egift cards. There will be 2 drawings per week over the four weeks of the official data collection period -- Week 1($100, $100), Week 2($75, $75), Week 3($50, $50) Week 4 ($25, $25) Additionally, participants may benefit from this research by contributing knowledge about eLearning satisfaction and continuance.

9. **Risks:** There are no known risks associated with this study. All information provided will be confidentially managed and accessible to the project manager for research purposes only.

10. **Right to Refuse:** Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

11. **Privacy:** Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

12. **Consent:** The study has been described to me above, and I have been informed about avenues for obtaining a copy of these terms and additional information regarding this study. I may direct additional questions regarding study

specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb.

Click here for a copy of the consent form.

Do you agree to the above terms? By clicking 'Yes', you consent that you have read and are willing to answer the questions in this survey.

- ○ Yes
- ○ No

Expectation

EXPECTATION

Please answer the questions based on your knowledge and beliefs, PRIOR to your enrollment in NCBRT eLearning.

I expected...

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Information Quality						
a. Using NCBRT eLearning would help me learn new skills and knowledge.	○	○	○	○	○	○
b. The NCBRT eLearning information would meet my learning needs.	○	○	○	○	○	○
c. The NCBRT eLearning would provide up-to-date information.	○	○	○	○	○	○
d. NCBRT eLearning would provide relevant information and topics for my job/role.	○	○	○	○	○	○
e. The NCBRT eLearning would provide accurate information.	○	○	○	○	○	○

EXPECTATION

Please answer the questions based on your knowledge and beliefs, PRIOR to your enrollment in NCBRT eLearning.

I expected....

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
System Quality						
f. Using NCBRT eLearning would provide me flexibility to learn on my own time.	○	○	○	○	○	○
g. The NCBRT eLearning system would be easy to use.	○	○	○	○	○	○
h. The NCBRT eLearning						

system would always be accessible.	○	○	○	○	○	○
i. The functions of the NCERT eLearning system would work well.	○	○	○	○	○	○
j. NCERT eLearning would have course materials that would keep my attention.	○	○	○	○	○	○
k. The NCERT eLearning system would give the ability to learn at my own pace.	○	○	○	○	○	○

EXPECTATION

Please answer the questions based on your knowledge and beliefs, PRIOR to your enrollment in NCERT eLearning.

I expected...

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Service Quality						
l. NCERT eLearning would have an easy to use registration and enrollment process.	○	○	○	○	○	○
m. If faced with difficulty, NCERT eLearning staff would provide a quick response.	○	○	○	○	○	○
n. NCERT eLearning staff would be dependable.	○	○	○	○	○	○

Perception/Performance

PERCEPTION/PERFORMANCE

Please answer the questions based on your experience AFTER using NCERT eLearning.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Information Quality						
a. Using NCERT eLearning helped me learn new skills and knowledge.	○	○	○	○	○	○
b. The NCERT eLearning information met my learning needs.	○	○	○	○	○	○
c. The NCERT eLearning provided up-to-date information.	○	○	○	○	○	○
d. NCERT eLearning provided relevant information and topics for my job/role	○	○	○	○	○	○
e. The NCERT eLearning provided accurate information.	○	○	○	○	○	○

PERCEPTION/PERFORMANCE

Please answer the questions based on your experience **AFTER** using NCBRT eLearning.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
System Quality						
f. Using NCBRT eLearning provided me flexibility to learn on my own time.	○	○	○	○	○	○
g. The NCBRT eLearning system was easy to use.	○	○	○	○	○	○
h. The NCBRT eLearning system was always accessible.	○	○	○	○	○	○
i. The functions of the NCBRT eLearning system worked well.	○	○	○	○	○	○
j. NCBRT eLearning had course materials that kept my attention.	○	○	○	○	○	○
k. The NCBRT eLearning system gave me the ability to learn at my own pace.	○	○	○	○	○	○

PERCEPTION/PERFORMANCE

Please answer the questions based on your experience **AFTER** using NCBRT eLearning.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Service Quality						
l. NCBRT eLearning had an easy to use registration and enrollment process.	○	○	○	○	○	○
m. When faced with difficulty, NCBRT eLearning staff provided a quick response.	○	○	○	○	○	○
n. NCBRT eLearning staff was dependable.	○	○	○	○	○	○

Disconfirmation

DISCONFIRMATION

COMPARED to your **initial expectations**, please rate the following:

	Much Worse Than Expected	Worse Than Expected	Somewhat Worse Than Expected	About the Same As Expected	Somewhat Better Than Expected	Better Than Expected	Much Better Than Expected
a. To help me learn new skills and knowledge was	○	○	○	○	○	○	○
b. The flexibility to learn on my own time was	○	○	○	○	○	○	○
c. The ability to learn at my own pace was	○	○	○	○	○	○	○
d. NCBRT eLearning information was	○	○	○	○	○	○	○

e. NCERT eLearning system performance was	○	○	○	○	○	○	○
f. NCERT eLearning usability was	○	○	○	○	○	○	○
g. My experience with using NCERT eLearning was	○	○	○	○	○	○	○
Click to write Statement 8	○	○	○	○	○	○	○

Did you require any technical support while using NCBRT eLearning?

- ○ Yes
- ○ No

DISCONFIRMATION

COMPARED to your initial expectations, please rate the following:

The technical support provided was

Much Worse Than Expected	Worse Than Expected	Somewhat Worse Than Expected	About the Same As Expected	Somewhat Better Than Expected	Better Than Expected	Much Better Than Expected
○	○	○	○	○	○	○

Satisfaction

SATISFACTION

For the following statements, please choose the most accurate choice.

I am _____ with my use of NCBRT eLearning.

Very Displeased	Displeased	Somewhat Displeased	Somewhat Pleased	Pleased	Very Pleased
○	○	○	○	○	○

I feel _____with my NCBRT eLearning experience.

Very Frustrated	Frustrated	Somewhat Frustrated	Somewhat Content	Content	Very Content
○	○	○	○	○	○

I feel _____ with my decision to register and participate in NCBRT eLearning.

Very Displeased	Displeased	Somewhat Displeased	Somewhat Pleased	Pleased	Very Pleased
○	○	○	○	○	○

I feel _____ with what NCBRT eLearning offers.

Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
○	○	○	○	○	○

Overall, I feel _____ with the learning experience that NCBRT has given me.

Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
○	○	○	○	○	○

Continuance Intention

CONTINUANCE INTENTION

For the following statements, please choose the most accurate choice as it relates to what your eLearning plans.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. I intend to continue using NCBRT eLearning to access more courses.	○	○	○	○	○	○
b. I intend to use other emergency response related eLearning systems to access more courses.	○	○	○	○	○	○
c. I intend to use eLearning systems to access other educational courses.	○	○	○	○	○	○

I intended to complete _____of the 7 NCBRT eLearning courses.

- A Coordinated Response to Food Emergencies: An Introduction
- Disaster Mental Health Considerations During a Weapons of Mass Destruction/Terrorist Incident
- Effects of Weapons of Mass Destruction/Terrorism Incidents on Bulk Distribution
- Effects of Weapons of Mass Destruction/Terrorism Incidents on Mass Feeding
- Effects of WMD Incidents on Mass Sheltering
- Foundational Awareness of Weapons of Mass Destruction/Terrorism
- Shopping Center Security Terrorism Awareness Training Program

Continuance Behavior

CONTINUANCE BEHAVIOR

For the following statements, please choose the most accurate choice. Feel free to log in to NCBRT eLearning, if you don't remember.

http://newelearn.ncbrt.lsu.edu/Login/Login.aspx?ReturnUrl=%2fDefault.aspx

I have completed the following sections in the following courses:

	Did not Intend to Take This Course	Nothing Completed	PreTest	PreTest and Course Content	PreTest, Course Content, and PostTest
A Coordinated Response to Food Emergencies: An Introduction	○	○	○	○	○
Disaster Mental Health Considerations During a Weapons of Mass Destruction/Terrorist Incident	○	○	○	○	○
Effects of Weapons of Mass Destruction/Terrorism Incidents on Bulk Distribution	○	○	○	○	○
Effects of Weapons of Mass Destruction/Terrorism Incidents on Mass Feeding	○	○	○	○	○
Effects of WMD Incidents on Mass Sheltering	○	○	○	○	○
Foundational Awareness of Weapons of Mass Destruction/Terrorism	○	○	○	○	○
Shopping Center Security Terrorism Awareness Training Program	○	○	○	○	○

I completed NCBRT eLearning courses as I intended.

- ○ Strongly Disagree
- ○ Disagree
- ○ Somewhat Disagree
- ○ Somewhat Agree
- ○ Agree
- ○ Strongly Agree

Motivation

MOTIVATION

For the following statements, please choose the most accurate choice as it relates to why you chose to register and participate in NCBRT eLearning.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. I use NCBRT eLearning to increase my sense of accomplishment.	○	○	○	○	○	○
b. I use NCBRT eLearning to improve my status among my peers.	○	○	○	○	○	○
c. I use NCBRT eLearning to increase my chances of obtaining rewards (e.g.	○	○	○	○	○	○

promotion, pay increase, etc.).						
d. I believe it is worthwhile for me to use NCBRT eLearning .	○	○	○	○	○	○
e. I use NCBRT eLearning to satisfy an organizational requirement.	○	○	○	○	○	○

General Satisfaction

GENERAL SATISFACTION

For the following statements, please choose the most accurate choice.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. I am satisfied with the city in which I live.	○	○	○	○	○	○
b. I am satisfied with my co-workers.	○	○	○	○	○	○
c. I am satisfied with the people that I know.	○	○	○	○	○	○
d. I am satisfied with my friends.	○	○	○	○	○	○
e. I am satisfied with restaurant food.	○	○	○	○	○	○

Demographics

What best describes your age?

- ○ 18-22
- ○ 23-30
- ○ 31-40
- ○ 41-50
- ○ 51-60
- ○ 61-75
- ○ > 75

What is your current primary professional discipline?

- ○ Emergency Management Service
- ○ Emergency Medical Services
- ○ Fire Service
- ○ Governmental Administrative
- ○ Hazardous Materials Personnel
- ○ Healthcare
- ○ Law Enforcement
- ○ Public Health
- ○ Public Safety Communications
- ○ Public Works
- ○ Student
- ○ Other

How long have you been in your current **profession**?

- <1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-25 years
- > 25 years

What is your current city of employment?

[redacted]

In which state do you currently work?

[redacted]

How long have you been in your current **position**?

- <1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-25 years
- > 25 years

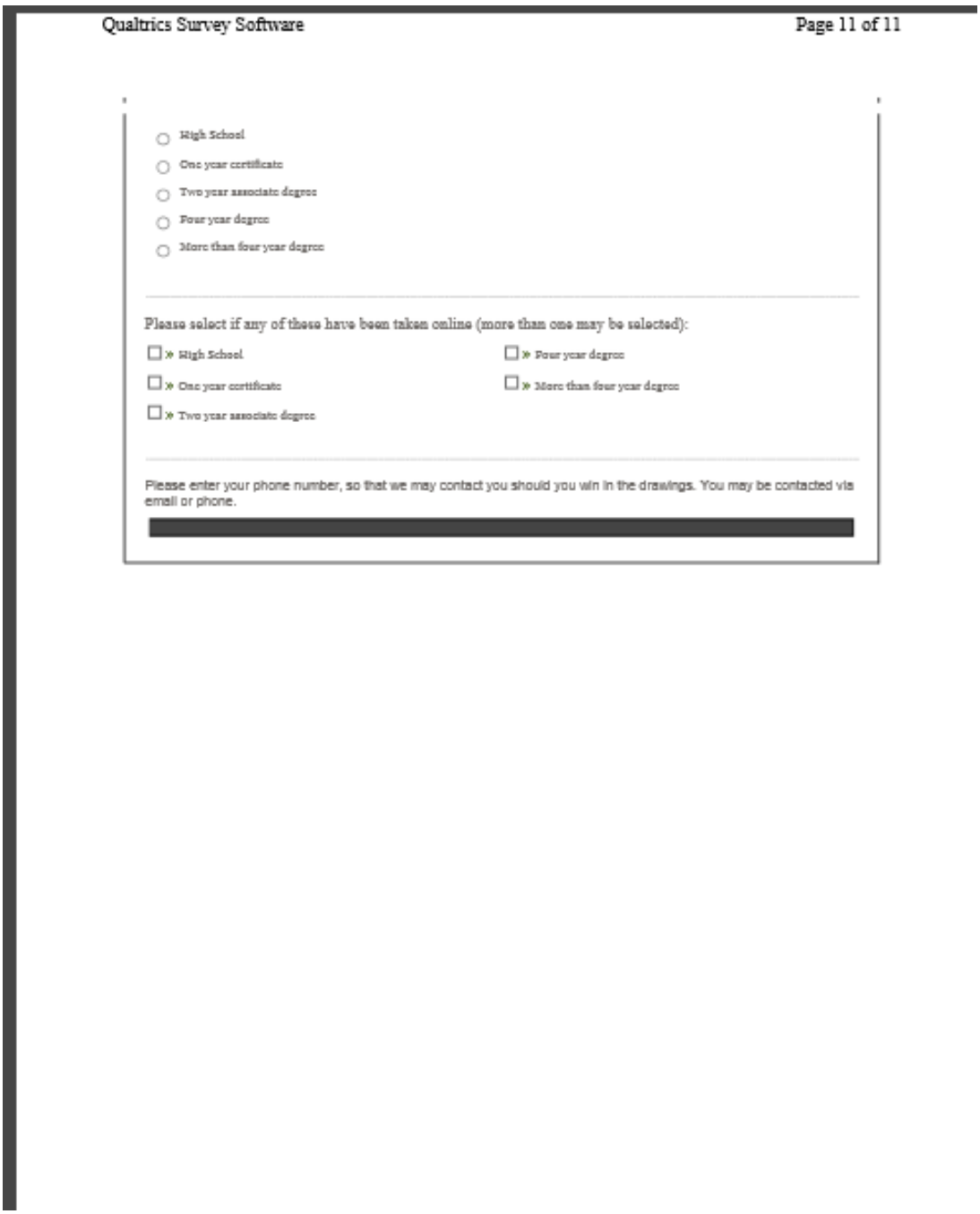
Prior to NCERT eLearning, how many different professional development training courses have you taken online?

- 0
- 1-2
- 3-5
- >5

What is your gender?

- Male
- Female

What is your highest level of education?



H.1 Research Protocol

This survey is part of a research project that aims to provide evidence-based knowledge for measuring and possibly improving eLearning learner satisfaction to those interested in emergency response training. NCBRT eLearning provides over 30,000 users with an opportunity to register into a system that offers a variety of emergency response eLearning

courses that are free to all United States citizens. Data from this project will be delivered to the organization and its training partners in an effort to better evaluate eLearning satisfaction and success. Based on the number of registered participants and on the dates set by the researcher, a purposive random sample will be selected. The learners will receive notification in the mail and then by email to participate in the online survey.

Potential study participants will receive the researcher's contact information (email addresses, telephone numbers, and addresses) in the postal notification and email; this contact information will be also placed online within the survey introduction. No exclusions will be made based on age, race, or sex. The survey will take approximately 15 minutes to complete. The data will be stored on password-protected computers and systems to which only the investigators will have access. None of the information collected poses any threat to the participants. A token incentive will be sent in advance for participating in the study. All project identification records associated with identifying information will be stored in a separate location that is only accessible to the investigators. Data collection will begin in February 2015 and conclude in March 2015.

H.2 eLearning Satisfaction: Online Survey Study

eLearning Satisfaction: Online Survey Study

Principal Investigators: Dr. Tracey Rizzuto; Susana Reyes Lee

Introduction

The purpose of this research project is to investigate eLearning participants' perceptions regarding their satisfaction and examine its relationship between continuance intention and user-reported continuance in an eLearning course. This research will also draw some attention to motivation as a moderating factor and its importance to satisfaction and continuance.

You are being invited to take part in an online survey along with roughly 400 other adults who are affiliated with NCBRT eLearning. Participation in this study is voluntary and all responses provided will be kept confidential.

Why are you invited to participate?

You are being invited to participate in this study because you have registered with NCBRT eLearning in the past year and therefore have valuable feedback to share regarding your satisfaction and the success of eLearning being offered.

Responsibilities/expectations

You will be asked questions about your learning preferences, motivations, and interests, along with a few items that assess your current work and life demands. The process should take approximately 10 minutes.

Potential risks and possible benefits

There are no known risks associated with this study. All information provided will be confidentially managed and accessible to the project investigators for research purposes only. No individually-identifying data will be collected, but general themes that emerge across all survey responses may be included in published literature. Participants' identities will remain confidential unless disclosure is required by law. Participants may benefit from this research by contributing knowledge about the satisfaction and continuance of NCBRT eLearning. In exchange for participation, individuals will be mailed token cash of $2 to promote the completion of the survey.

Voluntary participation

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dennis Landin, PhD., Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb. By clicking forward and responding to this survey, you are consenting to participate in this research study. You may retain this document for your records.

"The study has been described to me above, and I have been informed about avenues for obtaining a copy of these terms and additional information regarding this study."

Do you agree to the above terms? By clicking Yes, you consent that you are willing to answer the questions in this survey.

Instrumentation

Expectation (Strongly disagree…Strongly agree)
Please answer the questions based on your knowledge and beliefs prior to your enrollment in NCBRT eLearning.

I expected…

using NCBRT eLearning would help me learn new skills and knowledge.

using NCBRT eLearning would provide me flexibility to learn on my own time.

using NCBRT eLearning would give the ability to learn at my own pace.

the NCBRT eLearning system would be easy to use.

the NCBRT eLearning system would be reliable.

the NCBRT eLearning information would meet my needs.

the NCBRT eLearning would provide up-to-date and accurate information.

the NCBRT eLearning would offer me prompt service.

the NCBRT eLearning user interface would have a well-organized appearance.

the NCBRT eLearning system would take a long time to respond to my requests.

the NCBRT eLearning system would seldom be out of use.

the functions of the NCBRT eLearning system would work well.

NCBRT eLearning would provide relevant information and topics for my job/role.

NCBRT eLearning would have visually appealing materials.

NCBRT eLearning would not give me individual attention.

Perception/Performance (Strongly disagree…Strongly agree)

Using NCBRT eLearning helped me learn new skills and knowledge.

Using NCBRT eLearning provided me flexibility to learn on my own time.

Using NCBRT eLearning gave the ability to learn at my own pace.

The NCBRT eLearning system was easy to use.

The NCBRT eLearning system was reliable.

The NCBRT eLearning information met my needs.

The NCBRT eLearning provided up-to-date and accurate information.

The NCBRT eLearning offered me prompt service.

The NCBRT eLearning user interface had a well-organized appearance.

The NCBRT eLearning system took a long time to respond to my requests.

The NCBRT eLearning system was seldom out of use.

The functions of the NCBRT eLearning system worked well.

NCBRT eLearning provided relevant information and topics for my job/role.

NCBRT eLearning had visually appealing materials.

NCBRT eLearning did not give me individual attention.

Disconfirmation
7-point Likert scale from (1) equals Much Worse Than Expected to (7) equals Much Better Than Expected and (4) equals Same As You Expected

Compared to my initial expectations, the ability of NCBRT eLearning:

to help me learn new skills and knowledge was (much worse than expected ... much better than expected).

to provide me flexibility to learn on my own time was (much worse than expected ...much better than expected).

to give me the ability to learn at my own pace was (much worse than expected ... much better than expected).

to give me the ability to access quality information was (much worse than expected ... much better than expected).

to give me the ability to access a quality system was (much worse than expected ... much better than expected).

to provide me with quality service was (much worse than expected ... much better than expected).

Satisfaction

I am _____ with my use of NCBRT eLearning.

extremely displeased … extremely pleased

extremely frustrated ... extremely contented

extremely terrible ... extremely delighted

extremely dissatisfied ... extremely satisfied

Overall, my interaction with NCBRT eLearning is (was) very satisfying. (Strongly disagree…Strongly agree)

IT Continuance Intention

I intend to continue using NCBRT eLearning to access more courses. (Strongly disagree…Strongly agree)

I intend to continue using other emergency response-related eLearning systems to access more courses. (Strongly disagree…Strongly agree)

I intend(ed) to complete _____ of the 13 NCBRT eLearning courses.

IT Continuance Behavior

I have completed the following sections in the following courses: (Continuum should mark only one)

Pre-Test Course Content Post-Test Completed All Didn't Intend to Take

- Prevention and Deterrence—An Overview for all Disciplines
- eCDLS (eCore Disaster Life Support)
- CitizenReady: Pandemic Influenza
- Awareness and Response to Biological Events
- Preparing Communities for Agroterrorism: Awareness-Level
- Prevention and Deterrence of Terrorist Acts—Law Enforcement Version
- Disaster Mental Health Considerations During a Weapons of Mass Destruction/Terrorist Incident
- Foundational Awareness of Weapons of Mass Destruction/Terrorism
- Effects of WMD Incidents on Mass Sheltering
- Effects of Weapons of Mass Destruction/Terrorism Incidents on Mass Feeding
- Effects of Weapons of Mass Destruction/Terrorism Incidents on Bulk Distribution
- A Coordinated Response to Food Emergencies: An Introduction
- Shopping Center Security Terrorism Awareness Training Program

Motivation

(Strongly disagree…Strongly agree)

I use(d) NCBRT eLearning to increase my sense of accomplishment.

I use(d) NCBRT eLearning to improve my status among my peers.

I use(d) NCBRT eLearning to increase my chances of obtaining rewards.

I believe it is (was) worthwhile for me to use NCBRT eLearning.

I use(d) NCBRT eLearning to satisfy an organizational requirement.

Demographics

What best describes your age?	18–22 23–30 31–40 41–50 61–75 > 75
What is your current primary professional discipline ("Who Do We Serve?")	Emergency Management Service Emergency Medical Services Fire Service Governmental Administrative Hazardous Materials Personnel Healthcare Law Enforcement Public Health Public Safety Communications Public Works Student Other If other, please describe _____
What is your current city and state of employment? (two questions)	State – dropdown City – fill in
How long have you been in your current profession?	< 1 year 1–5 years 6–10 years 11–15 years 16–25 years > 25 years
How long have you been in your current position?	< 1 year 1–5 years 6–10 years 11–15 years 16–25 years > 25 years
Prior to NCBRT eLearning, how many different training courses have you taken online?	0 1–2 3–5 > 5
Gender	Male Female

Highest Level of Education	High school
	1-year certificate
	2-year associate degree
	4-year degree
	More than a 4-year degree

APPENDIX I. ANOVA TABLE

Table 23. ANOVA

		Sum of Squares	*df*	Mean Square	F	Sig.
LearnQualPer	Between Groups	0.850	5	0.170	0.283	0.922
	Within Groups	126.883	211	0.601		
	Total	127.733	216			
IntMotiv	Between Groups	16.675	5	3.335	3.142	0.009
	Within Groups	223.945	211	1.061		
	Total	240.620	216			
ExtMotiv	Between Groups	18.168	5	3.634	2.143	0.062
	Within Groups	357.716	211	1.695		
	Total	375.884	216			
LearnQualExp	Between Groups	0.482	5	0.096	0.191	0.966
	Within Groups	106.739	211	0.506		
	Total	107.221	216			
Discon	Between Groups	23.790	5	4.758	3.543	0.004
	Within Groups	283.398	211	1.343		
	Total	307.189	216			
Satis	Between Groups	2.087	5	0.417	0.523	0.759
	Within Groups	168.500	211	0.799		
	Total	170.587	216			
Contin Intent	Between Groups	8.229	5	1.646	1.755	0.123
	Within Groups	197.856	211	0.938		
	Total	206.085	216			
ConIntNumCourses	Between Groups	60.301	5	12.060	2.209	0.055
	Within Groups	1152.013	211	5.460		
	Total	1212.313	216			
TotalCoursesCompleted	Between Groups	56.450	5	11.290	1.694	0.137
	Within Groups	1405.937	211	6.663		
	Total	1462.387	216			

(table cont'd)

		Sum of Squares	*df*	Mean Square	F	Sig.
ConBehcompared	Between Groups	28.881	5	5.776	2.049	0.073
	Within Groups	594.760	211	2.819		
	Total	623.641	216			

VITA

Susana Jacqueline Reyes Lee was born in Santiago, Dominican Republic, in 1974 to Ramon Antonio and Expedita Cruz Reyes. In 1992, she graduated from West Jefferson High School in Harvey, LA. She is a first-generation high school and university graduate within her family. She has attained both her bachelor's and master's degrees from Louisiana State University (LSU). Upon completion of her doctorate, Susan hopes to find ways to contribute to the academic and research community.

Her strengths include that of translation and is considered to be an excellent communicator. Early in her career, she served as bilingual kindergarten teacher. Through the years, Susana has been able to gain great experience in various areas of talent development while incorporating technology. The majority of her career has been spent in government, from the State of Louisiana to LSU, but has lead several training and eLearning initiatives that have positively impacted several departments and agencies across the United States. Susana's most recent opportunities have allowed her to grow in areas such as organizational development, leadership development, needs assessment, performance management, employee onboarding and orientation.

Susana will continue to contribute in other areas within the community. She is extremely interested in assisting students with early college and career planning. She is not only proud of her accomplishments, but also those of her husband, William B. Lee, II, as well as her children: Miles, Xana, and Cruz.