Investigating the Design Approach of Designers-by-Assignment: A Learner Analysis of Workshop Facilitators

A Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

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Spring Semester 2016
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Dedication

This document, the culmination of six years of perservance and focus, is dedicated to my sister, Jessica. She is my best friend, and understands better than anyone else I know what it means to accomplish one of your life's goal. I am looking forward to one day working with her as a colleague in design-based research.

Acknowledgements

The work conducted through this study could not have been possible without support from my colleages at Project Learning Tree. Thank you for taking an interest in this work, and seeing its practical implications.

Also, thank you to my advisor, Dr. Norton, for always being available when I needed help thinking through the intricacies of this research. I appreciated you sharing your experiences and perspective to guide me back in the right direction.

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Abstract

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George Mason University, 2016

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Over the past decade organizations have increasingly relied on designers-by-assignment to develop instructional materials and facilitate learning experiences, largely in part due to the rise in self-service technologies and the perception that professional instructional designers are not needed. Merrill (2007) estimated that up to 95% of all instructional design products may be created by these individuals who generally participate in instructional design activities as only a small part of their job and lack formal training in the instructional design profession. Despite this reliance on designers-by-assignment, organizations generally do not provide adequate support or professional development opportunities. The present study investigated the learning needs of a specific population of designers-by-assignment – workshop facilitators for a national environmental education nonprofit – for the purpose of collecting data to support the design of a future online professional development program for this network. The learner analysis

consisted of three instruments in addition to demographic questions: Design Approach Self-Assessment (based on Gibbons, 2003); Learning Design Skills Questionnaire (based on MacLean & Scott, 2011); and Online Learner Self-Assessment (modified from Watkins, Leigh, & Triner, 2004). The data were analyzed from the perspective of four position types (formal educators, natural resource professionals, nonformal educators, and university faculty) in order to assist in the development of persona profiles. Findings suggested that workshop facilitators across position types prefer a message-centric design approach, have distinct interests in developing their instructional design skills, and are ready to learn in an online environment. Recommendations focused on the practice of instructional design, specific design features to be included in a professional development program, and implementation of this program.

Chapter One

During the past fifteen years, the profession of instructional design has experienced a distinct shift in how organizations view and value instructional design and instructional designers. Merrill (2007) noted that many organizations simply do not see the need for professional instructional design and instead value technical skills and knowledge of instructional technology over instructional design. A report published by the American Society for Training and Development (ASTD) documented a similar observation by reporting a decrease of 27% in the number of instructional designers employed by organizations in 2002 (ASTD, 2003). More recently, additional indicators of this trend included a shortage of funding for instructional design projects and difficulty in 'getting a seat at the table' (ASTD, 2010).

The role of the instructional designer appears to be more and more confined to one's ability to use instructional technologies to develop content as opposed to conducting needs assessment, writing design documents, or evaluating outcomes. Typically, this content has been selected and sequenced by others, generally subject matter experts. This narrowing of responsibilities draws largely from the profession's tendency to downplay the value of instructional design within organizations. For example, there is a lack of rigor provided by the profession to recognize excellence in instructional design and concurrently promote good practices, and many practitioners do

not promote to management the value of leading the design and development of learning materials, therefore downplaying its importance (Carliner & Driscoll, 2009).

Another source of marginalization derives from the unusual lack of undergraduate programs available to prepare new instructional designers (Kim, Lee, Merrill, Spector, & van Merrienboer, 2008). In other professions, a person can study to enter the field immediately after college. Often in instructional design, practitioners find themselves first designing as part of their job and then decide to go back to school to complete a graduate degree in the field. Bean (2014) shared stories from several practicing instructional designers (including herself) about their accidental journeys into the field. Some inherited design responsibilities through promotion or a co-worker leaving the organization. Others were recognized for their talents in writing or using technologies such as Microsoft PowerPoint. Even when given the title of instructional designer, many of these individuals did not realize that instructional design was an actual profession until much later in their careers. This unexpected path into the field of instructional design (as opposed to being introduced at the undergraduate level at the start of one's career) demonstrates the professions' lack of recognition as trade.

Rise of Self-Service Technologies

One of the most important drivers in the shift of organizations' perceptions of instructional design and instructional designers arises from the ever-increasing number of easy to use, self-service technologies. Examples of these technologies include courseware-authoring ("rapid development") software (e.g., Articulate Storyline, Adobe Captivate, Lectora; Shank, 2013) in addition to typical computer processing software

(e.g., Microsoft PowerPoint; ASTD, 2010). Rapid development software converts existing materials such as a Microsoft PowerPoint slide deck into an e-learning course with little effort on the part of the user and minimal upfront investment on the part of the organization (Carliner & Driscoll, 2009). These technologies no longer require the skills of an experienced programmer to develop and publish learning materials, and consequently, the need for specialized expertise in instructional design or instructional technology seems unnecessary (Carliner & Driscoll, 2009; Merrill, 2007).

In addition to rapid development software, the increased availability of Web 2.0 technologies (e.g., blogs, wikis, discussion forums, virtual worlds, social networks; Livingston, 2010) now allows everyone to develop content for learning. Carliner and Driscoll (2009) noted that learners now are producers of content, and that Millennials finds social media to be particularly popular. A survey of professional instructional designers suggested that organizations likely will be increasing use of Web 2.0 technologies to support learning (ASTD, 2010).

Designers-by-Assignment

As instructional technologies become easier to use, more organizations are relying on internal subject matter experts to design and develop learning materials instead of instructional designers. Merrill (2007) referred to these informal practitioners of instructional design as designers-by-assignment. Unlike instructional designers, designers-by-assignment stay within their niche of subject matter expertise and generally do not seek out the role of designer. To be a designer-by-assignment means sharing one's expertise by teaching others, which typically represents an additional responsibility to

primary work responsibilities. In other words, design is simply one part of their job – not solely their job (Merrill, 2007). In addition to subject matter experts, Carliner and Driscoll (2009) noted that many designers-by-assignment come from other content creation types of professions (e.g., technical writing or marketing) that are becoming less valuable to organizations but still find applicability in the development of learning materials.

Several recent studies have attempted to identify characteristics of designers-by-assignment across a number of different contexts (e.g., Essmaker, 2012; Hooie, 2011; Pesce, 2012; Pickles, 2014). These studies generally focus on the tasks completed by designers-by-assignment during the design process. Unsurprisingly, participants across studies reported a lack of training in design practices (Essmaker, 2012; Hooie, 2011) and demonstrated a lack of knowledge of design terminology (Hooie, 2011; Pesce, 2012). Designers-by-assignment reported performing tasks similar to professional instructional designers and often omitted design tasks during a project citing reasons similar to those cited by professional instructional designers (e.g., decision already made or not enough time) (Hooie, 2011; Pickles, 2014). Pesce's (2012) study of librarians revealed that these designers-by-assignment followed a design approach similar to the familiar ADDIE (analyze, design, develop, implement, evaluate) model used by professional instructional designers: Inquiry, Planning, Implementation, and Evaluation. However, she observed that designers-by-assignment focused considerably more time and effort on the Inquiry and Implementation phases than professional instructional designers.

In practice, designers-by-assignment most likely perform as novice instructional designers. Developing expertise requires extensive deliberate practice or the acquisition of a skill as a series of gradual changes over time in stable states of performance (Ericsson, 2004; Ericsson, 2006b). Because designers-by-assignment do not practice instructional design as their primary job responsibility, it is unlikely that they have many opportunities for the types of deliberate practice associated with expertise as an instructional designer.

A plethora of literature that has studied novice instructional designers may be useful in understanding the design approach of designers-by-assignment. For example, novice instructional designers infer little information from the design problem (Clark, 2008; Chi, 2006; Rowland, 1992); immediately begin identifying solutions, jumping to ideas about the structure and function of the solution (Chi, 2006; Newstetter & McCracken, 2001; Rowland, 1992); consider one factor at a time (Hardre, Ge, & Thomas , 2006; Kirschner, Carr, & von Merrienboer, 2002; Perez & Emery, 1995; Rowley, 2005); consider fewer factors (Chi, 2006; Newstetter & McCracken, 2001; Perez & Emery, 1995); view design as a linear process (Newstetter & McCracken, 2001); and are better at answering concrete questions (Adelson, 1984). These may also be attributes of the designer-by-assignment as well.

Statement of the Problem

Effective instructional design holds value in every organization by supporting the learning needs of its employees (or students). Consider a bank, for example. New employees must learn the policies and procedures necessary to follow organizational and

Federal regulations. They must also learn good customer service skills in order to attract and maintain a solid customer base for the company. Typically, the bank's training department (which may or may not include an instructional designer on staff) takes on the responsibility of training employees. What would happen if the design of the new hire training program was not effective, and recent graduates of the program were unable to perform their jobs at an acceptable level of proficiency? For the organization, the potential consequences range from minor (increased employee performance errors) to moderate (losing customers) to more severe (being investigated by the Federal Deposit Insurance Corporation (FDIC)). For employees, they may lose their new job within a short period of time, causing the bank to spend substantial amounts of money to recruit and hire a replacement – a losing scenario for any organization.

Organizations believe everyone can design instruction (and teach) simply because of their expertise and years observing teaching practice through class attendance (Merrill, 2007). After all, everyone has the basic knowledge, skills, and abilities to design a learning intervention (Cross, 2011). Consequently, designers-by-assignment are becoming a much larger practitioner group (Kim, Lee, Merrill, Spector, & van Merrienboer, 2008). Merrill estimated that designers-by-assignment may produce as much as 95% of all instructional design products (2007). While that percentage may seem high, it is not unrealistic considering the wide range of instructional design products that must be designed – from simple job aids to synchronous training sessions to complex asynchronous multimedia simulations – and the vast need for learning materials and events in every organization.

Despite the need for effective design, the profession suffers from an abundance of poor design. If a typical employee is asked what comes to mind when they think of training or e-learning, they will likely describe a boring webinar, a tutorial where they clicked "next" just to complete it, or an in-person training class that took them away from their job for days on end. These examples demonstrate a lack engagement as well as a lack of perceived value to the learner. From his own experiences, Merrill (2007) noted that many instructional design products fail to achieve expected outcomes as they are often ineffective, inefficient, and frustrate learners.

A recent movement, the Serious eLearning Manifesto, pointed to the inadequacies of most e-learning products and commented that trends in the field make it unlikely that this will change anytime soon unless practitioners make a commitment to good design (Allen, Dirksen, Quinn, & Thalheimer, 2014). In response, this movement provided grounded standards and called upon instructional designers to deliver an optimized learner experience that supports the transfer of knowledge to the job. However, designers-by-assignment – many of who do not even realize they are doing instructional design – are much less likely to seek out and then apply a grounded approach to design simply because they do not know otherwise. Perhaps one reason for the abundance of poor design is that much of it is done by designers-by-assignment not trained in instructional design best practices. A review of the literature suggests that not much is known about the practice of designers-by-assignment, nor of their needs (if any) to develop knowledge, skills, and abilities in instructional design.

Need for Professional Development

For designers-by-assignment to be successful at designing and developing effective instruction, professional development and on-the-job performance support is needed. For example, an organization might offer a training and certification program for designers-by-assignment so that they can apply best practices in instructional design when developing learning materials. Although some organizations do offer this extensive form of professional development, it is rather uncommon (Carliner & Driscoll, 2009). Alternatives might include assigning an instructional designer to help designers-by-assignment apply best practices (Pesce, 2012) or designers-by-assignment might be encouraged to seek out resources such as Williams' (2008) *The Non-Designer's Design Book* or Bean's (2014) *The Accidental Instructional Designer*. However, if designers-by-assignment do not recognize that they are doing design, they are less likely to proactively seek assistance or obtain additional resources.

Kim, Lee, Merrill, Spector, and van Merrienboer (2008) suggested that the responsibility to develop and support designers-by-assignment falls to the instructional designers who manage designers-by-assignment. For example, these managers might inspire designers-by-assignment to apply best practices and develop tools (e.g. a checklist) to provide appropriate performance support. Kim et al. (2008) explained that designers-by-assignment often design effective learning materials when working from good examples, suggesting that such scaffolding may be effective in helping designers-by-assignment on-the-job. However, Merrill (2007) commented that instructional design

programs generally do not prepare instructional designers to manage designers-by-assignment let alone develop tools to support them.

The context. The present study investigated the learning needs of a specific designer-by-assignment population – training workshop facilitators – in order to inform the later design of a professional development program for these designers-by-assignment. These designers-by-assignment support the efforts of a national non-profit organization to promote environmental education across the country and abroad. The work of these designers-by-assignments largely impacts the organization's ability to achieve its goals as they directly interact with the organization's customer base. In recent years, the organization has observed a need to help these designers-by-assignment focus the design of their training workshops on achieving performance outcomes as opposed to focusing on the event itself (e. g. logistics, number of attendees, making the workshop interesting). For these reasons, the organization seeks a professional development program to help these designers-by-assignment think more like instructional designers as they design workshop agendas and provide engaging learning experiences for customers.

Research Questions

In order to design a successful professional development program for training workshop facilitators (designers-by-assignment), an extensive learner analysis was needed. The overarching goal of the present study was to collect data regarding the needs and barriers of designers-by-assignment in order to inform key professional development design decisions later. To do this, the study first identified where designers-by-

assignments fell in Gibbons' (2003) four centrisms that correspond with how a designer approaches the design process. The following research question illustrates this goal:

R1: Do designers-by-assignment differ in their approach to the instructional design process?

Designers-by-assignment also provided self-assessment information regarding the learning design competencies they were interested in developing. This self-assessment data was examined and its relationship to design approach as described by the following research questions:

R2: Which learning design competencies do designers-by-assignment identify as of interest for inclusion in their professional development?

Also, this learner analysis sought to identify the degree to which the target audience was ready to participate in an online learning program based on the Online Learner Self-Assessment (Watkins, Leigh, & Triner, 2004). The following research question reflects this goal:

R3: To what degree do designers-by-assignment recognize themselves as ready to learn in an online environment?

Finally, the relationship between the above questions and demographic information such as years of experience, education, and access to technologies was explored.

R4: Is there a relationship between approach to instructional design process, learning design competencies, abilities in using online tools, factors important to online success, and demographic information?

Conceptual Framework

The structure of the present study followed the procedure for an extensive learner analysis of a population of designers-by-assignment. (See Figure 1.) Gibbons' (2003) four centrisms provided the foundation of the study. These four centrisms – media, message, strategy, and model – describe a progressive continuum often observed in novice instructional designers as they gain experience and knowledge of the field. By identifying how designers-by-assignment approach design, a baseline can be established to guide the design of a future professional development program. An understanding of design approach may also correspond with learning design competencies that designers-by-assignment perceive as important to their personal professional development. This information will later inform the content selected to be included in the design of a professional development program.

Because the target population lives across the United States, the study investigated the readiness of designers-by-assignment to learn in an online environment. This data were collected using the Online Learner Self-Assessment (Watkins, Leigh, & Triner, 2004) and provided information about participants' abilities and other factors assisting with their success as online learners. Finally, the study collected essential demographic information such as years of experience in conducting workshops, frequency of workshops conducted, education, and current profession.

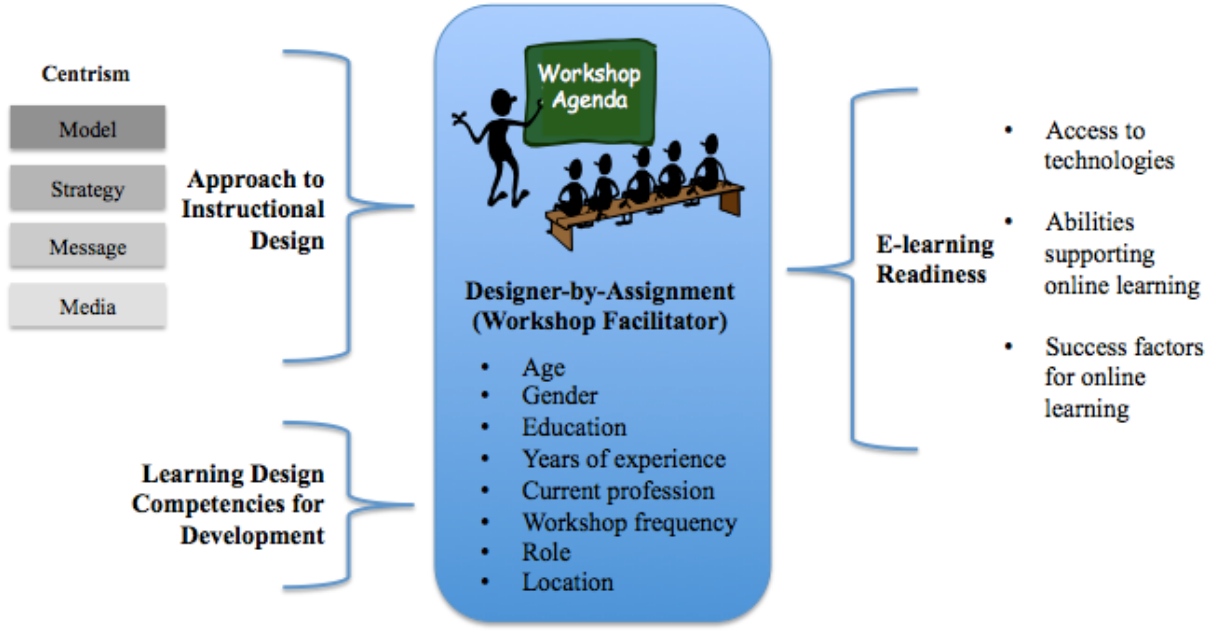

Figure 1. Conceptual framework for present study.

Definitions

The following operating definitions provide clarification of important terms used in the present document.

Baby boomer. A term that describes the generation of adults born between 1946 and 1954 (between 51 and 69 years of age in 2015) (Fry, 2015).

Designer-by-assignment. A person who is tasked or assigned as an instructional designer although he or she is not trained in instructional design (Merrill, 2007)

Expert. An experienced individual who can solve difficult problems within their domain of knowledge; may be highly regarded by peers (Hoffman, 1998)

Expertise. The skills, knowledge, abilities, and other characteristics that differentiate experts from novices and others with less experience or skill (Ericsson, 2006a)

Instructional design. A linking science that builds upon the research and practices of other fields such as computer science, cognitive psychology, and communication (Brown & Green, 2006); describes the general process of analyze, design, develop, implement, and evaluate

Gen X. A term that describes the generation of adults born between 1965 and 1980 (between 35 and 50 years of age in 2015) (Fry, 2015).

Millennial. A term that describes the generation of adults born between 1981 and 1997 (between 18 and 34 years of age in 2015) (Fry, 2015).

Novice. An individual who is new to a domain of knowledge (Hoffman, 1998)

Professional development. Activities that lead to the individual's gradual and continual process towards mastery of a certain field's body of knowledge, methods and procedures (Rothwell & Kazanas, 2011)

Chapter Two

In order to study designers-by-assignment, an understanding of the design process and how one develops knowledge in design is required. The present literature review explores design as a general concept with specific focus on the design of instruction. In many ways, the principles of design apply across all design professions regardless of focus. The universality of design in part lends itself to the rise of instructional designers-by-assignment. Also, expertise is explained as well as how it manifests within the practice of instructional design. Finally, the paper discusses the process of increasing one's expertise in instructional design including the critical role of professional development. This need for professional development provides the foundation of the present study by highlighting how organizations can support instructional designers-by-assignment through professional development activities.

What is Design?

Design is everywhere and evident across all cultures around the world (Cross, 2011). Most objects in our day-to-day lives were designed to achieve a specific purpose. Often, the need to design stems from a perceived problem or need for improvement, and the designer is tasked with solving that problem. For example, the design of a desk chair provides a supportive place to sit and the design of a tablet provides mobile accessibility to the Internet. These designs reflect well-thought out and planned problem solving processes that ultimately add value in some way. In its simplest form, the concept of

design refers to the process of planning and making decisions about something that will be built or created (Merriam-Webster, n.d. a). In other words, design represents the precursor to the creation of a product in response to a perceived problem.

Design problems tend to be described as either well- structured or ill structured. Simon (1973) provides six criteria for identifying well- structured problems:

1. The problem includes criteria to test the solution.
2. The problem identifies initial and interim states.
3. Logical or "legal moves" to solve the problem as easy to recognize.
4. The problem solver's knowledge about the problem is identifiable.
5. "Legal moves" are obvious and reflect the laws of nature.
6. "Legal moves" do not require extraordinary levels of effort to solve the problem.

An example of a well-structured problem is that of a computer reminding an office employee about an upcoming deadline. Another example is the placement of a tablet outside of a meeting room stating the scheduled meetings for that day. If a problem does not meet the before mentioned criteria, it is likely an ill structured problem. Ill structured problems typically require innovation or creativity for the purpose of staying current or improving upon past products or services, such as in the fields of product development and computer programming (Kolko, 2011). In these cases, an ill structured problem likely requires some kind of design in order to be solved. An example of an ill structured problem is the design of a new software program to make word processing more efficient.

The process of solving an ill structured problem may include a number of subjective, interpretive steps along the way. Kolko (2011) described four of these steps, the first of which is acting on an informed hunch. Sometimes a commitment to a design or decision must be made in order to move forward even if all information is not yet in place (Step 1). The problem solver might also make a judgment during the process that is purely subjective to his or her biases and past experiences (Step 2). The problem solver often does not have all information about a person, product, or process but yet may have to make a decision based on that partial or incomplete information (Step 3). Finally, the problem constraints may need to be broken in order to solve the problem (Step 4). Each of Kolko's (2011) four steps emphasizes the creativity needed to navigate a problem and design a solution to solve that ill-structured problem, as is the case for the vast majority of instructional design problems.

Instructional Design Overview

Instructional systems design (ISD) describes the process of designing solutions to solve ill structured instructional problems. Consider, for example, an employee who does not know how to use the company's new software. Likely, this employee will learn those skills through some kind of formal training – an event that is likely planned and developed using some form of instructional systems design. Prior to the initial adoption of instructional design principles and processes, learning events (e.g. training) typically resulted in a wide range of outcomes with limited guarantees that learners would be able to apply that knowledge successfully (Reiser, 2001). Since the 1930's, learning professionals have worked towards expanding instructional systems design as a practice

and as a discipline in order to provide an effective approach for creating high quality educational materials and processes that achieve desired outcomes (Reiser, 2001). This application of instructional design has shown to make interventions more effective, efficient, and relevant (Gustafson & Branch, 2006).

Brown and Green (2006) described the discipline of instructional design as a "linking science" that builds upon the research and practices of other fields such as computer science, cognitive psychology, and communication. The suggestion of a "linking science" can be observed in the many different models of the instructional design process, although certain activities are frequently found across instructional design models. These common activities are summarized by ADDIE: Analyze, Design, Develop, Implement, and Evaluate. Analyze describes the collection of data (e.g., observations, interviews) about the context, learners, and problem. The results of the analysis guide decisions made during the Design phase and includes identifying content to be included in the solution and planning how the content will be delivered (e.g., when, medium, sequence). Once the design is ready, the solution is Developed and made real – materials are created and all preparatory work is completed. Implement, for example, refers to putting the solution in place whether it is hosting a classroom instructor-led course or making a web-based tutorial available on the organization's learning management system. Finally, data are collected at various stages during the implementation so that it can be Evaluated to determine if the solution was effective and accomplished its goals. Gustafson and Branch (2006) noted that ADDIE activities are not

necessarily completed in a linear process but are usually done iteratively in a self-correcting manner instead.

Presently, the field offers a wide range of instructional design models from which a practitioner or researcher can choose. Most models rely on systems theory as an underlying concept (Edmonds, Branch, & Mukherjee, 1994). In accordance with systems theory, instructional design models typically address a number of interrelated items including the input from data sources, the process of design, and related outputs (Edmonds et al., 1994). Banathy (1987) described four characteristics of a system: interdependent, synergistic, dynamic, and cybernetic. Being interdependent suggests that system items need each other in order to accomplish the system's goals, and being synergistic explains how the system as a whole can best achieve goals (as opposed to the individual parts alone). Dynamic means that the system can adapt to changes effectively. Cybernetic results if the other three characteristics hold true and describes the ability of all items in the systems to communicate efficiently. Edmonds et al. (1994) illustrated common items and relationships found in instructional systems design such as situational assessment comprised of learner analysis and performance gap analysis, instructional goals, pilot testing, media selection, instructional strategies, and evaluation (summative and formative). As suggested by Edmonds et al., instructional systems design typically relies on interdependent, synergistic, dynamic, and cybernetic characteristics throughout the process.

As previously mentioned, instructional design yields many models originating from various fields and learning theories. Andrews and Goodson (1980) suggested that

models of instructional design fulfill four key purposes. First, instructional design models help to improve learning and instruction through a systematic problem solving process. These models also improve management practices of the instructional design process through monitoring and control as supported by a systematic approach. Many models follow an iterative sequence of design, feedback, and revision which helps improve evaluation processes. Finally, instructional design models allow opportunities to test, build knowledge about, and/or develop instructional theory through practice.

Selecting a model of instructional design for a given project can be daunting. Across models, Andrews and Goodson (1980) proposed four dimensions that can be useful in categorizing instructional design models: origin, theoretical underpinnings, purposes and uses, and documentation. Edmonds, Branch, and Mukherjee (1994) developed a new conceptual framework for selecting the most appropriate instructional design model based on the project. The conceptual framework incorporates a number of constructs including type of knowledge (procedural, declarative), level of expertise (novice, expert), industry, and what is to be designed (e. g. unit, lesson, module, or course). Edmonds, et al. (1994) also analyzed several models through this conceptual framework and noted that some instructional design models may be more appropriate for novices or for experts.

While the literature and plethora of models suggest that selecting a single model is the best approach to design, in reality instructional designers apply an eclectic approach to design when solving ill structured problems. In other words, instructional designers generally apply some kind of instructional design model (Ertmer et al., 2008) in

a flexible manner (Kenny, Zhang, Schwier, & Campbell, 2005). The result is a personalized, complex, and pragmatic approach to instructional design that loosely follows established models (Rowley, 2005). Also, this approach generally incorporates both constructivist and objectivist concepts and strategies (Christensen & Osgthorpe, 2004). Just as Edmonds, Branch, and Mukherjee (1994) suggested selecting the most appropriate model based on the type of project, instructional designers in practice selectively choose related activities to complete during design depending on the project and related constraints (Holcomb, Wedman, & Tessmer, 1996).

What Instructional Designers Actually Do

The trend of formal education in instructional design (and related fields) perhaps suggests that instructional designers are trained in a consistent manner, at least to some extent. However, several studies indicate substantial variation in the practice of instructional design and the knowledge, skills, and abilities demonstrated in the field. Leigh and Tracey (2010) reviewed the literature to examine practice variation in instructional design with a focus on specific groups of behaviors: planning and analysis, design and development, formative and summative evaluation, and implementation and management. They noted several key findings:

- Needs assessments are conducted less than 30% of the time (Mann, 1996; Tessmer & Wedman, 1992; Wedman & Tessmer, 1993; Winer, Vasquez-Abad, & Tessmer, 1994)

- Needs assessment are performed in an abbreviated and inconsistent manner with a focus on designing the solution instead of on identifying the problem (Holcomb, Wedman, & Tessmer, 1996; Visscher-Voerman & Gustafson, 2004)
- The most frequently performed design task by instructional designers is writing learning objectives, and all other design tasks are performed with varying frequency with some tasks (e.g. identifying learning outcomes, writing test items) designated to subject matter experts (Mann, 1996; Wedman & Tessmer, 1993; Winer, Vasquez-Abad, & Tessmer, 1994)
- Reports of evaluation frequency were low (Wedmer & Tessmer, 1993; Winer, Vasquez-Abad, & Tessmer, 1994) although pilot testing and follow up evaluation was higher (Holcomb, Wedman, & Tessmer, 1996; Mann, 1996)
- In practice, instructional designers are generally not included in the implementation or management of the solution even though instructional designers typically plan for implementation during the design process (Visscher-Voerman & Gustafson, 2004)

Leigh and Tracey (2010) suggested plausible reasons for the variation in instructional design practice that included contextual factors where decisions may have already been made, a limited project schedule, limited access to the client, and limited budget. Another possible reason may be the attitudes of instructional designers regarding a given task's importance or even the instructional designer's skill level (e.g. novice vs. expert). They proposed that level of design expertise may have more influence on how tasks are completed as opposed to which tasks are completed. The results of a survey

study conducted by Villachica, Marker, and Taylor (2010) supported this notion: supervisors reported that the performance (i.e. design tasks) of their novice instructional designers did not meet expectations.

In the past few years, several researchers have begun investigating whether the tasks required of instructional designs on-the-job map to the tasks associated with the design process per the literature. For example, Kenny, Zhang, Schwier, & Campbell (2005) noted several non-traditional tasks and skills frequently required of instructional designers: communication; editing and proofreading; marketing; media development and graphic design; project management; research; supervision of personnel; teaching students/faculty development; and technology knowledge/programming. Studies like that by Kenny et al. (2005) attempted to better understand differences in how the process of instructional design is conceptualized for practice and how it is actually done in practice. Hardre (2013) reported a perceived dissonance in graduate-level instructional design programs where students often ask professors about "real world" instructional design. Hardre (2013) mentioned some characteristics of "real world" instructional design (as described by some practitioners) that generally refer to controlled and focused processes to achieve specific outcomes with an emphasis on a behaviorist process design approach. These types of projects often described contract instructional design work where tight schedules, limited budgets, and few resources are normal.

Designers-By-Assignment

The literature regarding what instructional designers do almost solely focuses on trained professional instructional designers. However, the majority of instructional design

work is actually completed by subject matter experts and others with no formal training in instructional design. For some, the design of instruction becomes a necessity of one's job because of a job promotion, the absence of a co-worker, or as recognition for aptitude in using instructional technologies (Bean, 2014). These design tasks might be to teach new employees or to help convert content into a shareable online format. For these individuals, design represents a new job responsibility in addition to the many other tasks required of them by the organization (Merrill, 2007). Others migrate to instructional design from other creative professions such as marketing or technical writing because these professions are less valuable to the organization (Carliner & Driscoll, 2009). Merrill (2007) referred to these informal or accidental practitioners as "designers-by-assignment" and estimated that 95% of all instructional design projects are completed by designers-by-assignment.

Designers-by-assignment follow a similar design process to that of professional instructional designers. Pesce (2012) studied community college instruction librarians and how they made design decisions when designing a single session library workshop for students. Using a multiple case study research design, Pesce collected data through semi-structured interviews and observations of a think aloud exercise. Results suggested that these designers-by-assignment followed a four-step process of design. First, participants identified content based on the type of workshop session requested and their own experience with student skill levels (Inquiry). Next, they planned the details of the session from selecting facilities and resources to writing objectives (Planning). During the Implementation, participants hosted the workshop session and typically followed a

lecture format. Finally, participants collected Evaluation data through formative student feedback and summative evaluation tools provided by their department. This four-step process mirrors the five-step ADDIE model (analyze, design, develop, implement, evaluate) taught to and applied by professional instructional designers, although the design and develop steps are combined into the Planning step for designers-by-assignment. This finding may be because the design of instructor-led training (such as these library workshops) often has increased planning requirements (e.g. schedule the location, create a registration system) and fewer materials to develop when compared to design of online learning.

Just as professional instructional designers do not always complete all instructional design tasks for a given project, designers-by-assignment are also selective about which tasks to complete. Hooie (2011) surveyed K-12 instructors who were developing and teaching new online offerings about the frequency of which instructional design tasks were completed and why they selected not to complete them. This study replicated a survey administered to professional instructional designers by Wedman and Tessmer (1993). The findings of Hooie's (2011) study reflected similar tasks completed (or not completed) by professional instructional designers. For example, both designers-by-assignment and professional instructional designers frequently implemented writing learning objectives and selecting instructional strategies. However, the reasons for not implementing a task varied. For example, professional instructional designers indicated that the decision to select instructional strategies was already made by the client prior to

the design process. In contrast, designers-by-assignment were simply not aware that their design responsibilities included selecting instructional strategies.

Pickles (2014) conducted a mixed-method study similar to that completed by Hooie (2011) and surveyed college professors who had been tasked with developing and facilitating online courses. As with Hooie's (2011) study, Pickles (2014) administered Wedman and Tessmer's (1993) survey and followed up with interviews in order to better understand why designers-by-assignment selected (or did not select) to complete each design task. Pickles' (2014) findings differed from previous studies, identifying different design tasks reported as the most frequently completed. Reasons for not selecting a task to complete often emphasized that the decision was already made – a finding similar to Wedman and Tessmer's (1993) study. However, Pickles (2014) attributed this reason to the participants' lack of understanding of the design process, suggesting that these designers-by-assignment may not have realized that these tasks were within their responsibilities as designers.

A reoccurring theme within the literature on designers-by-assignment appears to be an underlying lack of knowledge about design and the instructional design process. Hooie (2011), Pesce (2012), and Pickles (2014) all commented on their observations that participants did not demonstrate common understanding of design terminology or concepts. Even though design as a process occurs with or without use of common terms or awareness of concepts, Hooie (2011) and Pickles (2014) noted that participants' lack of knowledge impacted their understanding of the design process and of their role within that process. Each of these studies recommended professional development and/or

performance support to assist designers-by-assignment in producing effective designs and making good design decisions. However, how to design and develop a professional development program and performance support tools for designers-by-assignment has not yet been investigated within the literature. For this reason, the present study seeks to fill this gap.

Design Expertise and Development of Expertise

In order to design a professional development program and performance support tools for designers-by-assignment, an understanding of expertise and expertise development is needed. Experts and expert performance exist across all disciplines and fields. Generally speaking, an expert is "a person who has special skill or knowledge relating to a particular subject" (Merriam-Webster, n.d. b). This person may be someone recognized for years of practice or experience in a given field or for doing a specific task and may also be perceived as a reliable authority with advanced knowledge and skill. Expertise refers to the characteristics that differentiate experts from novices in terms of knowledge, skills, and abilities (Ericsson, 2006a). This section reviews the literature to further define expertise as it has been studied across disciplines and also as it pertains to instructional design.

Expertise across disciplines. What does expertise look like? The literature examines expertise through a number of interrelated perspectives including proficiency, years of experience, and cognitive processes. Together, these three perspectives offer a view of expertise as it applies to all disciplines.

***Levels of proficiency*.** Expertise is generally studied from two perspectives: the

absolute approach and the relative approach. The absolute approach studies exceptional people in order to learn how they perform within their domain of expertise. The relative approach compares experts to those with less expertise (or non-experts) such as novices (Chi, 2006). The concept of "non-expert" includes varying levels of proficiency, and a person's proficiency can be at any level, ranging from novice to expert. Hoffman (1998) outlined seven levels of proficiency that illustrate how one might develop or progress within a domain:

- Naïve: A person who is totally ignorant of a domain
- Novice: Someone who is new to a domain
- Initiate: A novice who has begun to study in the domain after introductory activities
- Apprentice: A person who is learning the domain beyond the introductory level
- Journeyman: A person who can perform tasks unsupervised but with direction
- Expert: An experienced and brilliant journeyman who can solve difficult problems within the domain and is highly regarded by peers
- Master: A journeyman or expert who is qualified to teach others at a lower level, and often influences the rules and standards within a domain

The concept of proficiency (e.g. novice, expert) takes into account a number of variables such as academic qualifications, seniority or years of experience, and reputation (Chi, 2006). These different variables influence development from novice to expert and offer opportunities for study of that development.

Role of experience. Despite the popular belief that years of experience in a

domain are indicative of expertise, research in this area lacks support for this idea. While most individuals perform within a domain to an acceptable level, few go beyond to the level of expert suggesting that years of experience do not necessarily correlate with expertise (Ericsson & Lehmann, 1996). In other words, achievement of expertise does not automatically result from experience (Ericsson, 2006a). However, deliberate experience – or practice within a domain that is specific and focused, and accumulates over time – is essential to the attainment of expertise in that domain (Ericsson, 2006b). Therefore, the development from novice to expert requires substantial deliberate practice of tasks within the domain as part of the vast amount of experience.

Cognitive processes. The study of expertise is heavily grounded in information processing theory. In this model, learning is the transformation of information from the surrounding environment into memory. The learner requires the use of working memory and then long term memory in order to accomplish this transformation. Working memory has limited capacity (e.g. seven plus or minus two) and stores visual information separately from phonetic information (e.g. words). Working memory is where the learning process occurs, and if there is too much stimuli the learner faces issues with cognitive load due to the limited capacity of working memory. Learned information lives in long-term memory, which has unlimited capacity although no processing ability. Long term memory stores information in two forms - declarative and procedural knowledge - and is made up of mental models or schemas that are unique to each individual (Clark, 2008).

Experts within a given domain hold certain advantages in how they process information compared to novices. For example, experts hold much more information in long-term memory as they have more knowledge of the domain in general, but this large amount of information decreases the amount needed in working memory (Clark, 2008). In other words experts can process more information more efficiently because of the schemas they already have stored in long-term memory. Another advantage of expertise is automacity where tasks can be accomplished without the use of working memory because the procedural knowledge is already stored in long term memory (Clark, 2008). Individuals with well-developed schemas in a subject area are also better able to integrate new information within long-term memory compared to those lacking related schemas (Clark, 2008). Understanding how experts process information offers insight on how to assist novices in developing expertise within a given domain by helping managers to provide sufficient scaffolding to support their learning and development.

Expertise in instructional design. Exploring instructional design expertise first requires an understanding of what instructional designers actually do and what expertise looks like in practice. The literature focuses on three key areas: knowledge of instructional design concepts, principles, models and how it's applied; the tasks required to perform the job of instructional designer; and the cognitive processes – like problem solving – that underlie the instructional design process. The vast majority of literature investigating expert performance in instructional design focuses on the cognitive processes and approaches rather than the application of specific knowledge or the tasks

on-the-job. This section discusses key research about expert instructional design, first through novice-expert comparison studies then by expert-only research.

***Novice and expert designers*.** Rowland (1992) conducted a qualitative study using a think aloud protocol to observe instructional designers as they solved an instructional problem. The purpose of the study was to explore the process of instructional design as demonstrated in practice and to identify differences between more and less experienced instructional designers. Eight participants – four novices and four experts – were provided a problem statement and resource materials to be used in the design of a solution. Participants narrated their thoughts as they worked through the problem while researchers observed. Rowland identified several key findings. Novices interpreted problems as well-defined problems requiring little analysis whereas experts identified problems as ill-defined and requiring substantial analysis. Also, novices quickly identified an instructional solution and made decisions based on single factors. Expert designers, however, consider a number of ideas and types of interventions (not just instructional). They also based those design decisions on their own experiences and multiple, global factors.

A few years later, Perez, Johnson, and Emery (1995) conducted a think aloud qualitative study whose purpose was to identify differences between novice and expert thinking when practicing instructional design. Also, the study aimed to create a cognitive model of how instructional designers design. Nine instructional designers (five experts and four novices) were given a case study and asked to design an intervention. Participants narrated their progress through the design problem. Results found that

novices and experts used divergent paths when designing. Like Rowland (1992), the researchers found that novices spent less time than experts in exploring the problem and considered fewer solutions within a smaller range. The researchers suggested that novices *identify* the design problem whereas experts *interpret* the design problem.

Le Maistre (1998) investigated differences between novice and expert instructional designers as they approached the formative evaluation aspect of the design process. Two experts and one novice were provided instructional text to revise and data to analyze and guide revision decisions. Participants narrated their actions using the think aloud approach as they completed the revision process. Afterwards, participants were interviewed to clarify statements made during the narration. Le Maistre's (1998) results emphasized the characteristics of experts that differed from novices rather than a comparison of performance between novices and experts. Findings suggested that experts apply rich, well-organized knowledge in order to understand and represent the problem at a deeper-level. Experts also performed an extensive front-end analysis rapidly and efficiently and demonstrated excellent self-monitoring skills. Le Maistre (1998) compared (and confirmed) these results to generalized research of experts across fields.

***Expert instructional designers*.** Much of the literature focuses on what expert instructional design performance looks like rather than differences between novices and experts in how they practice instructional design. For example, Kirschner, Carr, and von Merrienboer (2002) compared the performance of expert instructional designers practicing in university and business contexts. The purpose of the study was to determine priorities of instructional designers and their general approach to the design process.

Participants were asked to prioritize their top three design principles from a list obtained through the literature. Also, participants were divided into teams to analyze and propose a solution for a design problem. Overall, participants showed similar preferences for priorities of design principles. However, their approaches to the design problem differed. Instructional designers from a business context demonstrated more interest in the client and obtaining client buy-in compared to university instructional designers.

Rowley (2005) studied the processes of expert instructional designers to identify common high-level processes demonstrated in practice in order to create a model of these processes that could be used by novice instructional designers. Using existing literature, the researcher developed an initial model. In order to validate and elaborate upon it, Rowley (2005) interviewed 19 expert instructional designers. As other research studies had found, Rowley (2005) discovered that instructional designers loosely followed instructional design methods and models and considered instructional design to be an emergent process. When designing a solution, they first worked out the larger aspects of the design and then progressively refined the smaller details. He also noted that expert instructional designers continuously seek out learning opportunities and even take the time to learn the content for which they are designing a solution. Rowley's (2005) findings identified eight success factors of expert instructional designers suggesting that they:

1. Follow a combination of linear and non-linear design processes,
2. Are opportunistic in adjust designs,
3. Use rapid prototypes early and often throughout the process,

4. Maintain a balanced design perspective,
5. Continually build design knowledge,
6. Enhance design skills when necessary,
7. Use well-targeted instructional design tasks, and
8. Use proven instructional strategies.

Ertmer et al. (2008) observed seven expert instructional designers to examine the processes they used in solving an ill-structured instructional problem. The researchers noted several key findings. First, experts focused on narrowing down the problem space to identify the key design challenges. Second, experts relied on their experience and knowledge as a frame of reference through which to analyze and interpret the design problem. The mental models of experts reflected specific instructional design knowledge and experience. The seven participants all approached the design problem in a way that indicated they applied some kind of instructional design model. Also, the designers all came to the same or similar conclusion about how to approach and conceptualize the design problem.

Developing expertise. When learning a new concept or set of skills, most people seek to obtain sufficient proficiency in order to perform at a functional level necessary to be successful. The literature suggests that approximately 50 hours provides enough practice to achieve an acceptable level of performance (Ericsson, 2006b). To become an expert, however, the literature loosely recommends ten years of practice (the "ten year rule"), noting that this number greatly varies by field (Ericsson, 2006b). Ten years of experience does not guarantee expertise development, and the literature clearly

distinguishes between these experienced non-experts and actual experts (e.g. Bereiter & Scardamalia, 1993). While not all individuals become experts, all individuals improve proficiency over time simply by performing routine tasks repeatedly. The literature suggests deliberate practice (specific and focused practice accumulating over time; Ericsson, 2006b), self-regulatory behaviors, and self-motivating beliefs are important in developing expertise.

***Deliberate practice*.** When expertise is limited to observations of reproducible superior performance (as opposed to socially recognized expertise), the literature recognizes several general claims about the relationship of expertise and experience (Ericsson, 2006b). More specifically, extensive experience – more than 1,000 hours – and training are necessary to achieve superior expert performance. However, not all domain practice supports the development of expertise. Deliberate practice describes an activity or series of activities specifically designed to improve performance in the domain (Ericsson, 2006b). Typically, the individual identifies performance goals and practices strategically to master those goals. To develop expertise, the number of hours of practice is not as important as the number of hours of deliberate practice.

Deliberate practice relies on the assumption that the acquisition of any skill occurs as a series of gradual changes over time in stable states of performance (Ericsson, 2006b), also referred to as the expert performance approach (Ericsson, 2004). These changes occur in physiological and cognitive mechanisms that eventually, through improvements, develop into observable change in performance such as increased endurance, strength, and speed (Ericsson, 2004). Deliberate practice necessitates access to training

opportunities that support the individual in effectively improving performance through the mastery of small steps or goals (Ericsson, 2004). These goals stretch the ability of the individual by being more difficult or challenging than what he or she can do at that time. With practice and feedback, the individual eventually masters those goals and then identifies new goals. This cyclical process requires the individual to concentrate on the task at hand, differentiating deliberate practice from the mindlessness associated with routine practice (Ericsson, 2004).

Self-regulatory behavior. Self-regulation supports the individual in developing expertise through deliberate practice. The process of self-regulation describes the goal-oriented actions used by the individual to learn and improve performance without requiring the support of others (Kitsantas & Dabbagh, 2010). In social psychology, self-regulation includes three key elements: behavioral, environmental, and covert (Bandura, 1986). Behavioral self-regulation focuses on an individual's ability to monitor his or her observable performance and made strategic adjustments such as when a baseball pitcher changes the arc of his throw. Environmental self-regulation emphasizes an individual's need to adjust his or her environment in order to support improvement in performance. For example, a musician may change the room temperature, influencing the pitch of the instrument. The third element, covert self-regulation, occurs when an individual monitors and adjusts his or her cognitive and affective states, such as when a singer changes her mental state to better deal with the stress or pressure of a live performance. Zimmerman (2006) suggested that these three elements form a cyclical process with each element connected by the use of a strategy and feedback on the success of the strategy.

The overall process of self-regulation includes several smaller processes that assist an individual with monitoring and adjusting behaviors, the environment, and mental states. Kitsantas and Dabbagh (2010) described six self-regulatory processes. First is goal setting where an individual identifies a standard or set of criteria and strives to achieve those goals. High achievers (or experts) select specific process goals that are challenging. Next, task strategies assist the individual in reducing the complexity of a task in order to create a more meaningful larger picture. Experts initiate learning tasks and focus on technique, selecting strategies that are appropriate for the task. In the self-monitoring, another self-regulatory process, an individual applies tools to help track his or her performance so that the individual is able to self-evaluate (a self-regulatory process) his or her performance against predetermined standards or set of criteria. Experts monitor their processes and evaluate their progress frequently. Also, the self-regulatory process of time management supports an individual in allocating time and sequencing activities to support performance development. Experts seek to learn how to better manage their time to be more effective in using their time. Finally, help seeking is necessary when an individual needs additional guidance from other people or from other resources. Experts are more likely to seek out help when they need it. Integrating each of these self-regulatory processes in the overall learning process supports an individual's ability to develop expertise.

Self-motivating beliefs. Self-regulatory processes are intertwined with self-motivating factors and occur in a three phase cyclical process (Zimmerman, 2006). The first phase, the forethought phase, involves the preceding learning processes and

motivational beliefs that influence how an individual learns and performs. During this phase, an individual analyzes the learning task and sets appropriate goals and identifies a strategy for attaining those goals. Through goal setting (a self-regulatory process), the individual may select process goals for improving techniques or outcome goals to improve performance results. Motivation comes through visualizing specific performance outcomes and placing value on a task that will achieve those desired outcomes. Individuals may also display a goal orientation if they place more value on the process of achieving those performance goals instead of actual goal achievement.

The second phase of the self-motivation process is the performance phase where an individual implements the goals, strategies, and motivational beliefs identified in the forethought phase. Experts are better able to select appropriate strategies and methods and implement them with more self-control. Self-instruction, a form of self-talk, and imagery, a method of creating or recalling clear mental images of success, also support the development of expertise in the performance phase. Often, task strategies and time management (two self-regulatory processes) help an individual implement strategies and monitor progress towards achieving performance goals. Successful expertise development also requires metacognitive behaviors through self-observation or self-recording to create an awareness of one's performance.

Self-reflection is the third phase of the self-motivation process and provides opportunity for the individual to self-evaluate. Compared to novices, experts strive to improve the accuracy in feedback received on their performance. Typically, experts focus on self-improvement (change from past performance), improvement compared to social

factors like competition, and/or working toward mastering knowledge or skills. How an individual interprets feedback from his or her self-evaluation depends on how it is interpreted and the criteria for success identified in previous phases. An individual must identify causes of errors in performance outcomes referred to as causal attribution. Decisions about causes influence how an individual makes inferences about how to best adjust self-regulatory behaviors. Experts generally demonstrate more adaptive inferences compared to novices who show more defensive inferences in their self-reactions to performance outcomes (Kitsantas & Zimmerman, 2002). Adaptive inferences prove more successful in helping an individual select more effective strategies for improving performance, whereas defensive inferences focus on protecting the individual from future dissatisfaction with his or her performance. Making adaptive inferences is influenced by performance beliefs including satisfaction with one's performance.

Avoiding the rut. Expertise development creates tacit knowledge of concepts and procedures that help the expert to perform more efficiently and effectively (Bereiter & Scardamalia, 1993). However, this increased reliance on routine also facilitates the expert's ability to fall into a rut that stops his or her improvement in performance (also referred to as arrested development) (Bereiter & Scardamalia, 1993). To combat arrested development, the mental representations of an expert demonstrate flexibility to allow for the needed improvements and adjustments to continue development (Ericsson, 2006b). Expertise goes beyond normal learning and requires continuous improvement or a reinvestment of mental resources toward the development of expertise (Bereiter & Scardamalia, 1993). In other words, building expertise requires putting effort into

learning itself such as by seeking out more difficult problems or by developing a more complex mental representation of an existing problem (Bereiter & Scardamalia, 1993). Progressive problem solving also helps the expert avoid arrested development. In this process, an individual's mental representation of a problem observes increasing complexities as a result of expanded knowledge and brings changes to light. These changes in how the problem is perceived represent increasing flexibility in the expert's mental representation.

Professional Development

In the development of design expertise, practicing instructional designers participate in a variety of activities ranging from instructor-led courses to browsing the Internet for resources. In combination, these activities lead to the individual's gradual and continual process towards mastery of a certain field's body of knowledge, methods, and procedures (Rothwell & Kazanas, 2011), or "professional development." Understanding the activities professional instructional designers use to develop proficiency may offer insight into how to design a professional development program and performance support for designers-by-assignment. The present section discusses these types of professional development activities and the literature in regards to specific instructional design professional development activities. Also discussed are the barriers faced by instructional designers in pursuit of professional development. In addition, the literature hints that professional development may be tied to social responsibility, and this is addressed to some extent.

Types of professional development activities. Professional development activities include a wide range of efforts to provide ongoing learning or development opportunities to practitioners (Desimone, Werner, & Harris, 2002) and generally fall into one of three types: formal, nonformal, and informal learning experiences (Coombs, Prosser, & Ahmed, 1973). Merriam and Bierema (2014) describe formal learning experiences as those sponsored by educational institutions, typically in a classroom setting. Pursuing formal professional development activities can also lead to the achievement of (or maintenance of) specific credentials, such as a certification or licensure, through professional associations in the field (Desimone, Werner, & Harris, 2002). Per a survey conducted by the eLearning Guild, more than half of practicing instructional designers have obtained a graduate degree in instructional design or a related field (Shank, 2011).

Formal development. On the path to developing expertise in the field of instructional design, most practitioners choose to complete at least one formal education or training program in instructional design or a related field such as instructional technology or adult education (Shank, 2012). Tracey and Boling (2014) noted that formal education programs (e.g. graduate degree programs or certifications) generally focus on the process of design as in embodied by the ADDIE (analyze, design, develop, implement, evaluate) model. When reviewing instructional design textbooks, they observed that content has changed relatively little over the past few decades. In other words, the general content knowledge taught in formal education settings has remained relatively consistent despite emerging epistemologies (Larson & Lockee, 2009).

In an effort to understand how well instructional design and technology graduate programs prepared students entering the workplace, Larson (2005) collected data using the Design Career Environments Survey. The study examined differences between generalist and specific-environment programs in order to determine whether or not graduates of specific-environment programs had an advantage when entering the workplace. Larson discovered several key findings including that generalist program respondents were overall more satisfied with their graduate program compared to specific-environment program students. All respondents felt at least somewhat prepared to practice instructional design in the workplace with specific-environment program students feeling more prepared. However, 25% of all participants felt unprepared to deal with the cultural aspects of the workplace, and eight (of 47) cultural workplace aspects were identified by at least 40% of respondents as being big issues. Some of these cultural aspects addressed key tasks required of instructional designers including: balancing quality, time, and costs of projects; challenging or criticizing design decisions made by supervisors; managing project resources; and managing one's own workload.

Larson and Lockee (2009) followed up on Larson (2005) by conducting a mixed-method study on one of the three exemplary instructional design and technology university programs identified through the survey. Faculty described six approaches as essential to successfully preparing graduate students for the workplace: a pragmatic approach; a systematic, systemic, and empirical approach to content and methods; an approach emphasizing change agency; a self-evaluative approach for both students and the program; an approach incorporating authentic, real-world contexts; and a

collaborative approach between faculty and students. Larson and Lockee (2009) also addressed the eight workplace cultural aspects from Larson (2005) and discovered that this graduate program offered opportunities for students and faculty to address these cultural aspects throughout the curriculum such as through internships, authentic project work, team collaboration, and reflection and discussion on client relationships.

As mentioned previously, several studies have noted variation in the practice of instructional designers in the field (e.g. Larson & Lockee, 2004; Tracey & Boling, 2014). Other studies have also noted discrepancies in the abilities of novice instructional designers to perform at an expected level of proficiency (e.g. Villachica, Marker, & Taylor, 2010). This research calls into question the degree to which formal institutions like universities prepare instructional designers to be successful practitioners. Hardre (2013) called attention to the perception of graduate students that degree programs do not reflect "real world" instructional design practice, although she noted that many programs have integrated authentic learning activities. As the research on expertise development suggests, it's not necessarily about the authenticity of ISD class-based projects that best prepares novice instructional designers for the field but rather the need for more increasingly complex ill-structured instructional problems. However, degree programs typically have an established start and end date, limiting the sheer number of design opportunities for practicing and developing skills in instructional design. Likely, novice instructional designers enter the field with only a few design experiences under their belt. For these reasons, more research is needed to understand the development process of instructional design knowledge, skills, and abilities while on-the-job.

Nonformal development. Instructional designers also participate in nonformal learning experiences. Nonformal learning experiences are sponsored by organizations whose primary mission is not necessarily education such as a community center, a corporation, or a professional association (Merriam & Bierema, 2014). Examples of nonformal learning experiences include company-sponsored employee orientation training, a project management workshop offered by a professional association, and an art class provided by the local recreation center. These activities are all learning events that must be hosted and planned to some extent (Desimone, Werner, & Harris, 2002). These experiences typically require a minimal time commitment, are voluntary (to some extent), and take place in public settings (Merriam & Bierema, 2014).

Informal development. Informal learning experiences occur spontaneously and without structure in the many different contexts associated with everyday life (Merriam & Bierema, 2014). For example, a practitioner might read a journal article or discuss a design problem with co-workers. Christensen and Osguthorpe (2004) conducted a survey of instructional designers and asked which information sources they used most frequently to learn about new theories, trends, and strategies. Findings showed that the most frequently used source of information was social interactions with colleagues followed by instructional design books (including text books). Other sources of information included Internet sites, professional journals, and literature from other fields. Cheong, Wettasinghe, and Murphy (2006) found similar findings (learning from peers; use of books, online articles, and magazines). The widespread use of Web 2.0 technologies (e.g. blogs, wikis, content communities, discussion forums, social networks, and virtual

worlds) in many ways facilitates participation in informal professional development activities. Experts in the field generate much of this content, making it easier for users to quickly learn about emerging best practices and trends.

Barriers to professional development. The process of professional development is ongoing, meaning that it never actually ends throughout a practitioner's career. Rothwell and Kazanas (2011) noted that many instructional designers do not take time for professional development despite being dedicated and ambitious in the workplace; consequently, these practitioners are perceived as not motivated. In interviews conducted by Cheong, Wettasinghe, and Murphy (2006), participants identified several additional barriers including conflicts with personal life (marriage, child-rearing), financial constraints (unable to afford to participate in professional development opportunities), lack of organizational support, and limited organizational resources (including time). In general, participants believed that their organization should (at the very least) play a minimally supportive role in their professional development. For example, the organization might offer flexible work schedules or time off from projects so that they could attend professional development events. Interviewees also mentioned that their organizations did not offer professional development programs at all, giving the impression that there was a lack of interest in developing employed instructional designers (Cheong, Wettasinghe, & Murphy, 2006).

Rothwell and Kazanas (2011) discussed the impact of organizational barriers stating that employee perceptions of cost-conscious organizations might be that they do not support employee efforts for professional development. Some managers may be able

to overcome those perceptions if they are able to influence budgetary decisions. They argue that managerial support and encouragement are essential to helping instructional designers pursue professional development activities. Instructional designers might also consider forming a network with other instructional designers within their organization. They further recommended counseling for instructional designers who are adverse to professional development activities.

Value of professional development in instructional design. In many ways, an instructional designer may perceive professional development as an optional activity. However, if an individual is unable to perform at a proficient level, he might in fact jeopardize his job. That being said, do instructional designers have an obligation to their client organizations to be knowledgeable of new theories and approaches? Cheong, Wettasinghe, and Murphy (2006) believed they do, stating the practice of professional development is actually a social responsibility. Instructional designers are expected to maintain their level of proficiency and improve competency in order to deliver quality design that is reflective of best practices. Doing so ensures that design products help the client organization meets its goals and performance requirements (Rothwell & Kazanas, 2011). Papanek (1971) went even further, suggesting that good design practices ultimately impact the end user and that the designer is responsible for delivering a quality product that leaves a positive impact. "[The designer's] social and moral judgment must be brought into play long *before* he begins to design… In other words, will his design be on the side of the social good or not" (pp. 45-46).

Often the necessity of and requirement for professional development is reflected in field competencies or even organizational expectations. For example, the International Board of Standards for Training, Performance, and Instruction (IBSTPI, 2012) included two such competencies for instructional designers. "Update and improve knowledge, skills, and attitudes pertaining to the instructional design process and related fields" is listed as an essential competency for all practitioners, and "apply research and theory to the discipline of instructional design" as an advanced competency. In other words, instructional designers are expected to participate in professional development activities in order to be proficient or competent. Not doing so suggests that the practitioner does not meet performance expectations to be successful as an instructional designer. Despite its importance, many organizations and individual instructional designers do not make time for participation in professional development activities (as discussed previously). In the case of designers-by-assignment, they often do not even recognize themselves to be instructional designers at all therefore downplaying the importance of professional development in the field even more.

The Present Study

The presented study investigated the professional development needs of instructional designers-by-assignment through a comprehensive learner or audience analysis. Following the tradition of design-based research, this learner analysis represented a first iteration of the design process for a workshop facilitator professional development program. A learner analysis is a preliminary evaluation of the targeted audience's needs and abilities in order to ensure that the final solution will be meet the

audience's needs effectively and efficiently (Brown & Green, 2006). Understanding the target audience is a critical step in the instructional design process (Brown & Green, 2006). Smith and Ragan (2005) recommended approaching the learner analysis by focusing on stable and changing similarities and differences. Stable similarities refer to behaviors and characteristics common to almost all human beings such as cognitive processes. Stable differences describe characteristics that can be used to group learners into small groups that differentiate them from the large group such as gender, age, intelligence, or personality traits. Changing similarities include behaviors and characteristics that change over time through learners' development (e.g. acquisition of language skills) but are common to all human beings. The most challenging to analyze is changing differences which generally include learners' values, beliefs, skills, knowledge, and motivations.

In order to study designers-by-assignment, the present study collected data on learners' stable differences (e.g. demographic information including education level, gender, and years of experience) and changing differences. In this case, changing differences were measured by three overarching constructs: approach to design as illustrated by Gibbons' (2003) four centrisms; learning design competencies for professional development (based on a literature review by MacLean & Scott, 2011); and e-learning readiness (using the Online Learner Self-Assessment; Watkins, Leigh, & Triner, 2004).

Approach to design. Prior to designing any learning environment, the instructional designer must first identify the entry behaviors of the target audience. With

this information, learning and performance objectives can be developed and later used to direct the detailed design of the learning experience. In the present study, the entry-level behaviors of learners referred to their approach to designing workshops for educators. Although the literature focuses heavily on the difference in performance between novice and expert instructional designers, little research exists describing the design behaviors of designers-by-assignment. Unlike professional instructional designers, designers-by-assignment (like the workshop facilitators in this study) do not spend the majority of their time designing instruction, limiting opportunity for deliberate practice and increased proficiency. Rather, designers-by-assignment spend much of their time completing non-instructional design tasks. Therefore, the design approach of designers-by-assignment cannot be solely defined by specific behaviors. Instead, the present study focused on how designers-by-assignment approach the design process using Gibbons' (2003) four centrisms to define this construct.

As a professor of instructional design, Gibbons (2003) observed that students moved through four predictable phases (or centrisms) that reflected their level of maturity in regards to theory and practical knowledge. Each phase also represented a level of commitment on behalf of the student:

- **Media-centrism.** Initially, student instructional designers placed great emphasis on the selection and application of technology as a delivery medium. Students discussed instructional design in terms of technology instead of seeing technology as a tool to deliver the training design. For example, a student might focus on the technology's features (i.e. import

video, record narration) to guide the design process. Gibbons (2003) commented that these media-centric instructional designers often struggled to apply this framework to more complex instructional design problems.

- **Message-centrism.** As student instructional designers realized that using technology to frame their design was not always effective, Gibbons (2003) noted that students changed their focus to the delivery of the message in order to ensure the message was adequately impressed upon the target audience. Instead of emphasizing the technology, students placed greater importance on the message itself and used technology to increase the effectiveness of the message. For example, a student might employ photo editing software in order to provide illustrations that better describe a given scenario included in the training solution. Another example is a student creating simulations to provide to the target audience additional practice in using the organization's software.
- **Strategy-centrism.** As students practiced instructional design, Gibbons (2003) noticed that they recognized similarities in how messages and interactions were structured across projects. Students discovered that these similarities also had important implications for the design of instruction, and often students categorized these based on the type of instructional event (e.g. webinar, classroom training). Now, students' focus emphasized the identification of rules to be used to guide the design of information

delivery and interaction with the learner. For example, a student might design a self-paced tutorial to follow a specific set of rules (or strategies) such as presenting a topic with complementing text, images, and audio followed by a forced-choice knowledge check question to test for understanding. Gibbons notes that strategic-centrism lays the groundwork for helping the student develop logic templates that support more automated design processes.

- **Model-centrism.** Students who demonstrated model-centrism designed their solution with consideration for the learning system as a whole (Gibbons, 2003). This design focused on the performance needs of learners by identifying the types of problems learners were required to solve as part of their jobs. For example, a model-centric student instructional designer might spend more time identifying and capturing aspects of the subject matter in order to appropriately represent it through the design of an interactive learning experience. This type of design likely includes a variety of instructional solutions as part of the overall system such as performance support or coaching.

Gibbons (2003) noted that an instructional designer's focus on a particular centrism likely characterized the designer's a) perceived most important aspect of the design process and b) level of knowledge and comfort. As the designer gained experience and developed his or her knowledge-base, the design focus likely reprioritized attention to constructs represented in other centrisms. The present study investigated the design

focus of designers-by-assignment in order to provide a baseline of entry-level behaviors and knowledge regarding the design process. Using Gibbons' (2003) centrism as a lens, this study sought to characterize workshop facilitators' perceptions of design and level of knowledge and comfort in order to guide the future design of a professional development program.

Learning design competencies for professional development. In addition to one's design approach, the present learner analysis identified the content to be included in the design of a professional development program. For formal instructional designers, knowledge can be tied to competencies established by several professional organizations over the past fifty years and be used as a guide to improve one's own performance (Munzenmaier, 2014). For example, the Association for Educational Communications and Technology (AECT) published a list of 13 competencies (and supporting behavioral indicators) for instructional/training development professionals (Beery, et al, 1981). Other organizations that have established competency standards include the International Society for Performance Improvement (ISPI) (focus on human performance technology), the American Society for Training and Development (ASTD) (focus on training and development), and the International Board of Standards for Training, Performance, and Instruction (IBSTPI) – one of the most well-known competency models specifically for instructional design.

Unfortunately, little research exists regarding the competencies needed by designers-by-assignment. Rozitis (2014) conducted a Delphi study to investigate which competencies expert instructional designers believed were important for designers-by-

assignment who worked as formal educators for an online high school program. Rozitis (2014) utilized the competencies identified by professional organizations (such as the before mentioned) and, after three rounds with experts, his list was narrowed to ten competencies. These final ten competencies included effective communication; the inclusion of accurate subject matter content; knowledge and appropriate use of learning technologies; practice of ethics (and guiding others to be ethical); ability to modify content including learning assessments; content sequencing; use of learning strategies; and selecting appropriate resources and support processes.

Wills-Espinosa (2014) also investigated the competencies needed by designers-by-assignment through a Delphi study that included a panel of instructional design experts and school administrators who had experience working with instructional designers. Her study went a step further from Rozitis (2014) by identifying skills in addition to competencies. The results were categorized into five domains: professional foundations; planning and analysis; design and development; implementation and evaluation; and technology. Within each domain, Wills-Espinosa (2014) identified between one and five competencies with several accompanying skills. Some of these competencies mirrored findings from Rozitis (2014) (e.g. communicating effectively, and identifying and responding to ethical implications), although some did not (e.g. revising interventions based on collected data).

The present study investigated learning design competencies from the perspective of the designer-by-assignment – workshop facilitators. To do this, the study used a consolidated list of competencies developed by MacLean and Scott (2011). They

reviewed and consolidated several competency models into a single list of competencies divided into two broad categories: generic skills (i.e. project management, planning), and learning design skills (i.e. perform knowledge and task analysis, develop assessment strategies). The present learner analysis used this list as the foundation for identifying designers-by-assignments' perceived learning needs, such as how to write learning objectives or integrate technology into the design of a workshop.

e-Learning readiness. Prior to attending any learning experience, likely learners have predisposed impressions or experiences that may influence learning outcomes. Dick, Carey, and Carey (2005) recommended that instructional designers collect information about learners' prior experience, knowledge, and attitudes in order to determine how best to deliver content during the learning experience. For example, a learner who has never attended an online course may have anxiety or negative beliefs about their ability to participate in a virtual classroom. Another learner may be willing to learn online but have limited accessibility to the Internet and consequently may not feel motivated to complete an online course. Dick, Carey, and Carey (2005) also suggested identifying the degree to which the learner is willing to explore new technologies for learning. Learners' readiness (or perceived ability) to learn with technology can be evaluated through self-reports, such as with Watkins, Leigh, and Triner's (2004) Online Learner Self-Assessment tool. In regards to the present project, the learning environment was already identified to require at least one web-based technology because of the physical distribution of designers-by-assignment across the United States. The present study therefore identified learners' a) perceived abilities to learn with different learning technologies; b) access to using

different learning technologies; and c) motivation to explore new technologies as part of a new professional development program.

Summary

This section reviewed what it means to be a professional instructional designer as well as the rise of designers-by-assignment (or those who practice instructional design as part of their job and likely do not have formal training about instructional design). Also discussed was design expertise, differences in instructional design practices between novices and experts, and the activities needed to develop expertise. Finally, this section described types of professional development opportunities, barriers to participating in professional development, and the inherent value to individuals and organizations who do participate. The following section outlines the present study that investigated the learning needs of designers-by-assignment (workshop facilitators) with the intent to use this data to design and develop an online professional development program for this target audience.

Chapter Three

The purpose of the present study was to conduct a thorough learner analysis of designers-by-assignment who practice instructional design as workshop facilitators. In the tradition of design-based research, this learner analysis represented the first iteration in the process of designing a new professional development program for designers-by-assignment (workshop facilitators). Brown and Green (2006) defined a learner analysis as an initial evaluation of the targeted audience's needs and abilities for the purpose of designing an efficient and effective learning solution. Information collected about the target audience may include learners' current knowledge, attitudes, beliefs, demographics, and abilities. Depending on the requirements of the project, an instructional designer might obtain this information through quantitative or qualitative methods. Gathering this data helps inform the overall design of an intervention and ensures that the intervention meets the needs of the target audience. For this reason, Brown and Green (2006) noted that a learner analysis represents a critical part of the overall process in designing an instructional intervention.

The literature offers a plethora of instructional design models and approaches to learner analysis. Similarities exist across these models such as a focus on demographic characteristics (i.e. age), motivation, attitudes, talents, and abilities (Dick, Carey, & Carey, 2001; Morrison, Ross, & Kemp, 2004). Smith and Ragan (1999) categorized the

types of data collected during a learner analysis as stable or changing similarities or differences. Stable similarities refer to physical and cognitive attributes common to all human beings such as hearing and having two hands. Stable differences are also common characteristics but also identify subgroups such as based on age or gender. Changing similarities describe developmental processes such as language acquisition and intellectual development. Finally, changing differences refer to characteristics that vary across individuals such as knowledge, skills, attitudes, and beliefs.

Analyzing data collected through a learner analysis might include several steps, depending on the requirements of the project. Brown and Green (2006) recommended two approaches for instructional designers: charting learner data and creating learner (persona) profiles. For the first approach, the instructional designer identifies the type of data to be collected (e.g. age, years of experience, current knowledge) and appropriate methods for collection. With these data in hand, the instructional designer constructs a range of learner abilities across data types. Likely, this range describes what an average learner looks like, a below average or challenged learner, and an exceptional or gifted learner. In contrast, the instructional designer might use the data collected through the learner analysis to develop fictitious profiles or personas representing typical learners. This second approach offers a more humanistic view of the learners.

The present learner analysis investigated learners' stable differences (i.e. demographic information such as age, years of experience, current occupation) and changing differences (e.g. approach to design, abilities in using online tools, factors

important to online success, learning design competencies) in order to answer the research questions:

R1: Do designers-by-assignment differ in their approach to the instructional design process?

R2: Which learning design competencies do designers-by-assignment identify as of interest for inclusion in their professional development?

R3: To what degree do designers-by-assignment recognize themselves as ready to learn in an online environment?

R4: Is there a relationship between approach to instructional design process, learning design competencies, abilities in using online tools, factors important to online success, and demographic information?

In order to collect this information, this is a quantitative study applying a survey methodology. A survey is a tool that collects information by asking a sample of the targeted population questions and produces numerical descriptors (statistics) about that sample. A survey that is designed appropriately offers several benefits such as probability sampling (reduced biased and increased accuracy of responses) and standardized measurement (consistent responses that allow easy comparison between participants). Through a special-purpose survey, the researcher can include all needed constructs in the survey design and can more easily compare constructs across participants (Fowler, 2014). The survey component of the present study was designed specifically to collect data about designers-by-assignment as learners for a future professional development program.

Fowler (2014) noted that surveys generally have three key components – sampling, question design, and data collection – that, when addressed appropriately, ensure an effective survey design. In order to obtain a good sample, for example, Fowler recommended that almost all (if not all) of the target population be included in the distribution of the survey. (For larger populations, the researcher may apply probability methods to select a smaller sample for the survey, such as random selection.) This method ensures that all members of the population have an equal chance of participating in the survey. Question design, if not written carefully, may unintentionally bias participant responses. Best practices for question design include reviewing questions for clarity and meaningful responses and conducting a pilot or pretest of questions. In recent years, data collection procedures have moved from phone and in-person to online and through the mail. Selecting an appropriate data collection procedure depends on the target population (i.e. not everyone may have access to the Internet) and consideration for cost versus expected response quality. In the present study, the target population was distributed across the United States, and the survey was administered through email via the organization's listserv.

Participants

Participants were workshop facilitators (designers-by-assignment) for an environmental education organization providing professional development opportunities for formal educators (classroom teachers) and nonformal educators (e.g. nature center employees). Dispersed across the country and abroad, these workshop facilitators help educators learn through group processes in order to increase knowledge, build skills, and

develop awareness (Lippitt & Miller, 2005) about environmental education and how to use it to complement current curriculum. These workshop facilitators typically train educators infrequently (some only once per year) and the responsibility of training represented a small part of their overall responsibilities. For example, many workshop facilitators' primary responsibilities related to their roles within their state's department of natural resources (or another agency). For these reasons, workshop facilitators targeted in the present learner analysis represented designers-by-assignment per descriptions by Merrill (2007), and Carliner and Driscoll (2009).

Relationships. The researcher of the present study worked in the organization's national office and had limited interactions with only a few potential research participants. For the vast majority of the targeted population, the researcher had not worked directly with any of these designers-by-assignment. The organization supported a rather large network of state partners, facilitators (designers-by-assignment), educators, and students. Participants were members of this network, although the researcher had no direct influence over members within the network. None of the participants had a previous relationship with the researcher prior to the study.

Demographics. Ages of survey participants (n = 292, 249 female) ranged from 18 to 86 years with the majority between 35 and 50 years (39%; Gen X), or between 51 and 69 years (44.5%; Baby Boomers). Participants represented 32 states and a generally equal distribution across rural (37.3%), suburban (40.1%), and urban (22.6%) locales. Almost all participants had achieved a bachelor's degree (94.2%), and more than half had earned a graduate degree (57.5%). Participants worked across several contexts identifying

themselves as nonformal educators (47.3%), formal educators (17.0%), natural resource professionals (15.6%), or college/university faculty (18.0%). Regarding years of experience facilitating workshops, 36.6% of participants reported having 10 or more years, 24.3% reported having only one to three years of experience, and 18.5% reported four to six years. More than one-third (43.1%) of participants indicated they had conducted one or two workshops in the last 12 months, and 15.1% had conducted three to six workshops in the same period; 38.4% indicated they had conducted no workshops in the last 12 months. See Table 1 for a summary of demographic information.

Table 1

Participant Demographics

Characteristic		Percent
Gender	Male	14.7
	Female	85.3
Age	18-34 years	15.1
	35-50 years	39.0
	51-69 years	44.5
	70-86 years	1.4
Locale	Rural	37.3
	Suburban	40.1
	Urban	22.6
Education	Completed some college	3.4
	Associate's degree	2.4
	Bachelor's degree	25.3

	Completed some postgraduate	11.0
	Master's degree	40.4
	Other advanced degree	4.8
	PhD, law, medical degree	12.3
Position	Formal educator	17.0
	Natural resource professional	15.6
	Nonformal educator	47.3
	University faculty	18.0
Experience	<1 year	11.9
	1-3 years	24.3
	4-6 years	18.5
	7-9 years	7.5
	10 years or more	36.6
Workshops	None	38.4
	1-2 workshops	43.1
	3-6 workshops	15.1
	7-12 workshops	2.7
	13 or more workshops	1.0

Instrumentation

The study required the development of a survey instrument that included four components: a researcher-created scale for identifying the design approach of designers-by-assignment (Design Approach Self-Assessment); learning design competencies that

participants identified as of interest or not of interest to be included in their personal professional development (Learning Design Skills Questionnaire); a modified (updated) version of the Online Learner Self-Assessment (Watkins, Leigh, & Triner, 2004); and general demographic questions. During development, a panel of experts reviewed each of these components of the survey instrument for applicability to the target audience. This section describes how each component was developed.

Design approach self-assessment. The process of developing this component of the survey instrument followed several steps in order to ensure it measured the constructs it was expected to measure. Since no instrument assessing centrisms existed prior to this study, the survey instrument was built from scratch using best practices noted in the literature. The process of instrument development followed the five steps or activities outlined by Dimitrov (2012): define purpose of instrument; identify test specifications; develop items; review by experts; and conduct pilot study. (The last two steps – review by experts and conduct pilot study – were completed using the survey in its entirety: Online Learner Self-Assessment, Learning Design Skills Questionnaire, Design Approach Self-Assessment, and demographics.)

***Define purpose*.** By defining the instrument's purpose (including its domain, intended decision, constraints, and frame of reference; Dimitrov, 2012), the researcher can ensure that the succeeding steps of the development process align. The instrument developed for the present study fit into the domain of learning design with the purpose to identify the present design approach of designers-by-assignment. The primary constraint identified was the remote accessibility of participants, hence the need for the instrument

to be administered electronically. Finally, the data collected from the instrument yielded scores identifying each participant's relative position with one another (relative standing) – a norm-referenced assessment.

***Identify test specifications*.** The process of identifying test specifications requires a comprehensive definition of the construct based on general theory and then operationalized so that data collected from the instrument can be interpreted within the given context (Dimitrov, 2012). Often, defining the construct requires a search of the existing literature for key terms and phrases that can then be condensed to formulate a definition of each scale within each construct. For the present study, the construct – design approach or centrism – was defined as, *one's primary focus or emphasis when planning for and facilitating a workshop for educators*. Within this construct, each centrism was further defined based on Gibbons' (2003) descriptions:

1. Media-centric: A focus or emphasis on the medium or technology through which the training is delivered
2. Message-centric: A focus or emphasis on the presentation of content during the training event
3. Strategy-centric: A focus or emphasis on applying structure and rules to govern the delivery of training, creating design automation
4. Model-centric: A focus or emphasis on training as part of a larger learning system

Once defined, a model of the construct can be developed. This model illustrates the general structure of the construct (Internal Model), the construct's relationship with

other constructs (External Model), potential formats of items used to measure the construct (Developmental Model), and any related processes associated with the construct (Processing Model) (Dimitrov, 2012). With the construct model in hand, the construct can be operationalized into an extensive list of indicators that are later re-written into the specific format (with appropriate scale) required for the instrument (Dimitrov, 2012). Below is the proposed construct model for the present study.

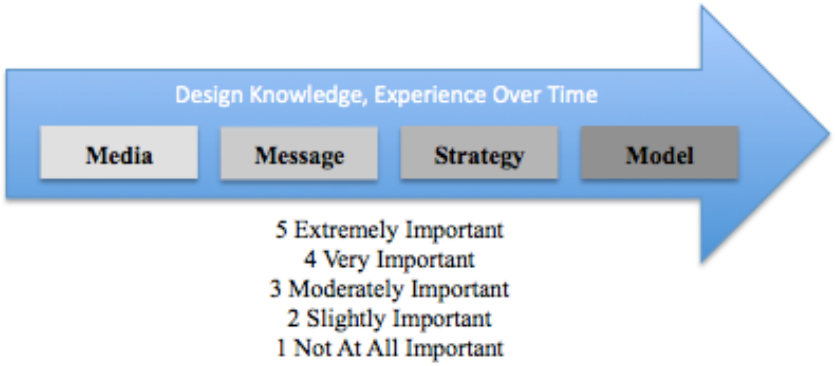

Figure 2. Construct model for design approach of workshop facilitators.

In this model, the general structure of the construct (Internal Model) includes the four centrisms described by Gibbons (2003) which have a progressive relationship (Processing Model) with one's increase in design knowledge and experience over time (External Model). Finally, the format of the items used to measure the construct prompt participants to identify the extent to which statements were important to them.

Develop items. For each centrism, twelve statements were written. The large number of statements served to ensure that at least some questions would map to each

construct during an exploratory factor analysis. (An exploratory factor analysis was beyond the scope of the present study and was not included.) Because each centrism emphasized one's focus of design (media, message, strategy, or model), these statements were written to correspond with a Likert-like scale depicting the extent to which the participant believed the statement was important to them.

When developing items, Fowler (2014) recommended several best practices for ensuring the data collected answers the questions of the study. For example, items should include adequate and complete wording in order to ensure that respondents understand what is being asked. Also, questions should ensure consistent meaning to all respondents by clearly defining terms and avoiding multiple questions ("do you have a cat and dog?"). When appropriate, questions should include a "don't know" or "not applicable" response option. Each of the statements was reviewed to follow these best practices. See Appendix B to review the Design Approach Self-Assessment.

Learning design skills questionnaire. In order to determine which learning design skills and competencies were relevant to the target audience, a series of questions based on the comprehensive framework of learning design competencies from MacLean and Scott (2011) were developed. The competencies were rewritten to remove jargon and improve clarity based on known experiences of the target audience. During the review phase, an additional statement was added that focused on facilitating workshops outdoors because this task was a specific expectation unique to these workshop facilitators. For a complete list of the statements included for this component of the survey, review Appendix C.

Online learner self-assessment. The Online Learner Self-Assessment measures the e-learning readiness or the degree to which learners are prepared to participate in an online learning experience (Watkins, Leigh, & Triner, 2004). This tool was designed in response to a general lack of valid and reliable instruments aiming to measure an individual's perceived readiness to engage in online learning. Watkins, Leigh, and Triner (2004) conducted a study with the purpose of collecting data to identify the construct validity and internal consistency of an instrument they developed. The tool was comprised of 27 questions focusing on the individual's access to technology, online skills and relationships, motivation, audio and video skills, online discussion skills, and factors important to the individual's success. The questions in the Online Learner Self-Assessment were reviewed for applicability to the goals of the present study. Several questions (and a few categories) were removed, and other questions were modified to increase relevance. For example, questions about technology access were expanded to include mobile devices. Appendix D presents the original Online Learner Self-Assessment and the modifications made for the purpose of the present study.

Demographics. In addition to the Online Learner Self-Assessment and Learning Design Skills Questionnaire, several demographic questions were included. These questions asked participants common questions such as age, gender, education, and location (state; urban, suburban, and rural). Other questions asked participants about their years of experience in facilitating workshops, their current profession (because workshop facilitator was often one task embedded within a larger job role), and their role (state coordinator or facilitator). Most importantly, participants were also asked about the

frequency which they conducted workshops. If the vast majority of participants only conduct workshops once or twice per a year, then how the professional development program will be implemented may be impacted. The list of demographic questions included in the survey of participants can be found in Appendix E.

Review by experts. An essential step in the process of survey instrument development is a review of items by experts with knowledge of the construct, target audience, and/or are responsible for making decisions based on the data collected by the instrument (Dimitrov, 2012). Expert review also collects evidence to support construct validity. A panel of experts – an organizational stakeholder and two subject matter experts representative of the target population – reviewed the survey instrument in its entirety. In addition, an expert in research design and collection ensured that item construction followed best practices. Results of the expert review suggested changes including clarification of language used so that statements were more relevant to the target audience, and the addition of statements specific to the target audience (i.e. conducting workshops outdoors).

Pilot study. Generally, the process of developing a survey instrument includes at least two (sometimes three) phases of data collection followed by revisions of different items. Typically, the first phase evaluates items individually on measurement characteristics including quality and relevance to the construct generally per expert review (Dimitrov, 2012). Next, the researcher administers the instrument to a sample of participants with the purpose of refining the instrument into a final form. Finally, the

instrument is administered to a representative sample in order to conduct a validation study to establish the measurement characteristics of the instrument (Dimitrov, 2012).

For the purpose of the present study, the survey instrument was reviewed by an expert in quantitative research methods (phase 1) and piloted with a small sample representative of the target population (phase 2). Results of the pilot test prompted several changes focusing on the general structure of the survey. For example, initially the three components (Online Learner Self-Assessment, Learning Design Skills Questionnaire, Design Approach Self-Assessment) were displayed randomly to the target audience. Comments from the pilot study suggested that they not be randomized. Also, pilot study participants seemed to need clarification about how the survey was organized and why it was organized that way. For that reason, language was added to the survey's introduction and clarified the instructions preceding each component of the survey.

Data Collection

Data were collected through an online survey over a five week period of time. In order to solicit participants, an email was distributed to state coordinators via the organization's listserv who, in turn, distributed the survey to their state network of workshop facilitators. (Note: The national organization had no direct contact with the majority of workshop facilitators due to the grassroots nature of its network.) Both state coordinators and workshop facilitators were invited to complete the survey, totaling approximately 1044 potential participants. This email directed participants to a detailed description of the research study that explained the overarching goals of the research study and provided general information about the included survey such as expected

duration. The email also included a direct link to the consent form embedded on the front end of the survey. Those who agreed to participate proceeded on to the survey. Participants who completed the survey were eligible to win a gift card through a random drawing. See Appendix F for a copy of the recruitment message. Reminder emails were sent to the state coordinators as well as reminded state coordinators at the organization's annual conference to forward the recruitment emails onto their network of workshop facilitators. Another reminder email was sent a week later to state coordinators. The response rate was estimated at 40.5%, representing 32 states (62.7%). (Due to the indirect nature of participant recruitment, only an estimated response rate could be obtained.) The time required to complete the survey ranged from 20 to 30 minutes.

Data Analysis

The survey results were analyzed based on the research questions initially developed and used to construct relevant persona profiles illustrative of the target population. Because the survey instrument had not been validated prior to the present study, each statement was evaluated based on the response distribution. In other words, statements that received higher indications (i.e. exactly descriptive or extremely important) were deemed to signify higher relevance to, or more characteristics of, the target population. Also, the data were analyzed by sorting participant responses by their position type: formal educator, natural resource professional, nonformal educator, university faculty, and other. This separation of position provided the foundation for the personal profiles and was deemed most appropriate because position would be indicative of the type of previous training received in regards to creating learning experiences for

others. For example, a formal educator teaching eighth grade likely has had more detailed training and experience in designing learning experiences compared to a natural resource professional who works for their state's department of natural resources. (Note: The sample size varied across instruments in the survey because individuals who did not complete the entire survey were still included in the analysis if they had fully completed at least one of the three instruments.)

R1: Do designers-by-assignment differ in their approach to the instructional design process?

The results of the Design Approach Self-Assessment yielded information describing where participants' design approach falls across the four centrisms. As each statement ranged from extremely important to not at all important, the data were interpreted based on the percentage of participants who indicated extremely important and very important. Also, participants' scores for each centrism were analyzed through a 4 x 4 analysis of variance (ANOVA) in order to identify differences in design approach scores by position type. Finally, participants' responses were scored to identify which design approach was preferred overall.

R2: Which learning design competencies do designers-by-assignment identify as of interest for inclusion in their professional development?

The results of the survey provided information about the level of importance of different learning design competencies for professional development. As each statement showed a distribution (extremely important to not very important), the data were interpreted based on the percentage of participants who indicated extremely interested and very interested

versus those that indicated moderately interested, slightly interested, and not at all interested (percentages).

R3: To what degree to designers-by-assignment recognize themselves as ready to learn in an online environment?

The results of the Online Learner Self-Assessment provided information about the degree to which participants agreed or disagreed with statements regarding factors important for and their abilities to use technologies to support online learning. As each statement showed a distribution of percentages (strongly agree to strongly disagree), the data were interpreted based on the percentage of respondents who agreed and strongly agreed versus those that disagreed and strongly disagreed (frequencies).

R4: Is there a relationship between approach to instructional design process, learning design competencies, abilities in using online tools, factors important to online success, and demographic information?

The results of the quantitative data collection provided data points across several categorical and continuous measures and were analyzed using regression in order to show the relationship (if any) between variables. Scores by design approach – a continuous variable – were correlated with position, education, number of workshops, and years of experience.

Reliability and Validity

Although the instrument used in the present study was constructed using best practices in survey development, measurements may or may not be accurate or consistent. Determining the instrument's reliability can be useful in identifying the degree

to which the data collected is free from random error (Dimitrov, 2012). In the classical concept of reliability, a person's observed score consists of a true score and error. Therefore, in calculating reliability, researchers can determine the degree of error variance. For the purpose of the present study, internal consistency reliability was calculated for each of the three components of the survey instrument by using a split-half reliability estimate, the Spearman-Brown Prophecy formula. (Other measures of reliability, i.e. test-retest reliability and alternate forms reliability, were not considered appropriate for the present study due to lack of data and therefore could not be calculated.) In order to calculate split-half reliability, the data were assigned into two groups by odd- or even-numbered questions. The Spearman-Brown Prophecy formula was appropriate to calculate reliability because the halves of each component of the survey instrument were parallel: same units of measurement, scale origins, and error variances (Dimitrov, 2012). The reliability for each component of the survey instrument was high: $\rho_{XX} = .93$ (Online Learner Self-Assessment); $\rho_{XX} = .97$ (Learning Design Skills Questionnaire); $\rho_{XX} = .97$ (Design Approach Self-Assessment).

High reliability of scores does not ensure that the instrument measures what it claims to measure; however, high reliability of scores is important for interpreting the instrument's validity (Dimitrov, 2012). During the construction of the survey instrument used for the present study, several types of experts (stakeholders, subject-matter experts, instrument development experts) reviewed the statements included on each of the three survey components (Online Learner Self-Assessment, Learning Design Skills Questionnaire, and Design Approach Self-Assessment) as well as the demographic

questions. The process of reviewing and editing the survey instrument contributed to building face validity evidence and logical validity evidence in order to support the content aspect of validity. Face validity evidence refers to the relevance of statements to the instrument's purpose, and logical validity evidence refers to the readability, suitability, and fairness of items included on the instrument (Dimitrov, 2012). Regarding the generalizability aspect of validity, the survey instrument included several context-specific statements and questions, which therefore limited its generalizability to other contexts. Other aspects of validity (i.e. structural) exceeded the needs of the present study, although may be evaluated through factor analysis in a future study.

Persona Profile Development

Persona profiles (often called user or learner profiles) describe fictitious individuals who represent specific key characteristics based on general characteristics collected about the target population (Kuniavsky, 2003). Persona profiles humanize data collected from (for example) a learner analysis (Brown & Green, 2006), as in the case of the present study, and reflect users' goals and expected behaviors (Goodwin, 2009). Creating persona profiles ensures that critical characteristics or behaviors are captured in a way that is easily understood by designers and stakeholders (Goodwin, 2009), and can be used in the design process as a tool for defining important features or characteristics of the learning environment (Kuniavsky, 2003). For example, role playing exercises can assist the designer in understanding learner needs and concerns when interacting with the learning environment.

In the present study, collected data included learners' demographic information (i.e. gender, age, experience) in addition to other constructs deemed important for consideration in the design of an online professional development program for designers-by-assignment (readiness to learn online, topics of interest to be included in the program, and a baseline of how learners approach the design process). With this information in hand, Kuniavsky (2003) suggested applying a free form clustering approach of assigning attributes to persona profile types that make the most sense. For the purpose of the present study, data was clustered based on the four types of employment positions: formal educator, natural resource professional, nonformal education, and university faculty as these positions likely reflect past training or education about how to teach others as well as depth of experience in teaching others. Someone with less training or experience (i.e. natural resource professional) likely will need more scaffolding than someone who has years of professional experience (i.e. formal educator).

Once created, the clustered profiles were used to create fictitious people epitomizing key specific characteristics and behaviors of each type (Kuniavsky, 2003). Persona profiles are written as narratives that include the fictitious individual's full name, photo, demographic information (i.e. age, gender), and other details that might describe his or her attitudes, goals, concerns, and strengths as a designer-by-assignment (Goodwin, 2009). Kunivavsky (2003) indicated that a basic persona profile includes a name, demographic description, the person's goals, his or her needs, his or her abilities, and his or her perspective (on participating in an online professional development program for workshop facilitators). Altogether, this information builds a story and can be

used to describe how this person might behave in a given scenario (i.e. will he or she be willing to participate in a synchronous learning experience?) (Kuniavsky, 2003). Before design begins, each persona profile should be reviewed by other stakeholders for believability and then prioritized. In the case of the present study, nonformal educators represented more than 40% of respondents and likely will hold a higher priority in terms of influencing the design of the professional development program.

Ethical Considerations

For the purpose of the present study, George Mason University's Office of Research Integrity and Assurance (ORIA) reviewed all research materials for adherence to ethical guidelines. (See Appendix A for copy of ORIA approval letter.) These materials included the survey instrument, survey protocol, communications used for recruitment, and the participant consent form. Through these materials, participants were informed about the parameters of the study including what to expect from participation such as the types of survey questions. After reviewing this information, participants were given an opportunity to consent to or decline participation in the study. Data collected from participants remained anonymous and was stored on cloud-based servers associated with the study's affiliated university.

Chapter Four

The present study investigated the learning needs of workshop facilitators (designers-by-assignment) in order to design an appropriate and effective professional development program that supported their performance in the field. Data collected via an electronic survey were analyzed to answer the following research questions:

R1: Do designers-by-assignment differ in their approach to the instructional design process?

R2: Which learning design competencies do designers-by-assignment identify as of interest for inclusion in their professional development?

R3: To what degree to designers-by-assignment recognize themselves as ready to learn in an online environment?

R4: Is there a relationship between approach to instructional design process, learning design competencies, abilities in using online tools, factors important to online success, and demographic information?

These research questions sought to identify key information about the target population that would be later used to construct persona profiles depicting each of the four types of workshop facilitator as determined by their employment position: formal educator, natural resource professional, nonformal educator, and university faculty. The reasoning for this delineation was that position type most likely reflected differences in training

received regarding how to teach or train others. For this reason, the original data set was re-organized by position type and each research question was analyzed from this perspective. (Note: The total sample size varied across instruments in the survey because individuals who did not complete the entire survey were still included in the analysis if they had fully completed at least one of the three instruments. However, demographic questions were placed at the end of the survey. Therefore, the total number of individuals separated out by position type did not vary across instruments.)

Demographics by Position Type

In addition to the demographics collected for the overall sample population, demographic data was reviewed by position type.

Formal educators. Fifty participants (48 females) indicated they were or had been formal educators teaching students ranging from kindergarten through high school, or had been an administrator for a formal education program. The majority (90%) were 35 years or older, more than three-thirds (76%) had earned a master's degree or higher. Participants represented 25 states and generally lived in suburban settings (48%) compared to rural (38%) or urban (12%) settings. Approximately 44% reported having three years or less experience in facilitating workshops (20% with four to six years; 24% with ten or more years) and almost half indicated they had not conducted a workshop in the previous 12 months (46%) and 38% had conducted two or fewer (total of 84%).

Natural resource professionals. Forty-six (34 females) reported they were working as natural resource professionals with most between 35 and 69 years of age (82.6%). Forty-one percent had earned a bachelor's degree, and 32.6% had earned a

master's degree. Participants represented 22 states with almost half from rural locations (47.8%) and a third from suburban locations (34.8%). Approximately 48% had ten or more years facilitating workshops, although 80.5% reported conducting two, one, or none in the previous twelve months.

Nonformal educators. One hundred thirty-nine participants (122 females) identified themselves as nonformal educators, such as those working for an environmental education program or a community program like 4-H. Approximately 20% identified themselves as between 18 and 34 years, and 79.2% were older than 35 years. More than one-third indicated they had earned a bachelor's degree (36.7%), and 46.8% had earned a master's degree or higher. Participants represented 27 states and Japan and were almost evenly distributed across rural (30.2%), suburban (38.8%), and urban (30.2%) locations. Less than 40% reported having three or fewer years of experience in facilitating workshops; however, 80.2% reported conducting two, one, or no workshops in the previous twelve months.

University faculty. Fifty-three participants (40 females) reported working as (or retired from) faculty for a college or university (pre-service faculty or other). Participants between 18 and 35 years of age represented 7.5% of respondents; all others reported being older than 35 years. Approximately 85% had earned a masters degree or higher (56.6% had earned a Ph.D., law, or medical degree). Participants lived across 21 states with more than 80% indicating they lived in rural (43.4%) or suburban (39.6%) locales. Approximately one-quarter (26.4%) of participants had three years or less experience as a

workshop facilitator, and more than half (54.7%) reported conducting one or two workshops in the last year while 24.5% reported conducting none (78.2% total).

Table 2

Demographics (Percent) by Position Type

Characteristic		Formal Educators (n = 50)	Natural Resource Professionals (n = 46)	Nonformal Educators (n = 139)	University Faculty (n = 53)
Gender	Male	4.0	26.0	12.2	24.5
	Female	96.0	74.0	87.8	75.5
Age	18-34 years	10.0	15.2	20.1	7.5
	35-50 years	38.0	39.1	39.6	39.6
	51-69 years	52.0	43.5	37.4	50.9
	70-86 years	0.0	0.0	2.2	1.9
Locale	Rural	38.0	47.8	30.2	43.4
	Suburban	48.0	34.8	38.8	39.6
	Urban	12.0	17.4	30.2	17.0
Education	Completed some college	2.0	6.5	3.6	1.9
	Associate's degree	2.0	6.5	2.2	0.0
	Bachelor's degree	8.0	41.3	36.7	0.0
	Completed some postgraduate	12.0	13.0	10.8	7.5
	Master's degree	56.0	32.6	41.0	28.3

	Other advanced degree	18.0	0.0	2.9	5.7
	PhD, law, medical degree	2.0	0.0	2.9	56.6
Experience	<1 year	14.0	19.6	10.1	9.4
	1-3 years	30.0	15.2	27.3	17.0
	4-6 years	20.0	17.4	15.8	26.4
	7-9 years	8.0	0.0	10.1	5.7
	10 years or more	24.0	47.8	10.1	39.6
Workshops	None	46.0	43.5	38.8	24.5
	1-2 workshops	38.0	37.0	41.7	54.7
	3-6 workshops	14.0	15.2	15.8	13.2
	7-12 workshops	2.0	4.3	2.2	3.8
	13 or more workshops	0.0	0.0	0.7	3.8

Research Question 1

Using Gibbons' (2003) four centrisms (media, message, strategy, model) as a foundation, this research question sought to identify how workshop facilitators (designers-by-assignment) approached the instructional design process when preparing for a workshop. Forty-eight statements (12 per centrism) were developed to answer this research question. Statements identified by participants (n = 294) as extremely important or very important were considered to be characteristic of participants in that position

type. Generally speaking, the results did not show much difference between centrisms regardless of position type.

Media-centric. Participants (overall) identified spending time to create or update materials for a workshop as important when preparing to facilitate a workshop (84%), identifying the best way or approach to deliver a workshop (73.5%), and selecting a delivery approach with which they are comfortable (70.4%). Formal educators also identified considering a variety of delivery approaches (84%) and considering the features and benefits of a variety of workshop delivery approaches (78%). Natural resource professionals identified considering the features and benefits of technology (78.3%).

Message-centric. Participants (overall) indicated that these statements were important to their consideration when preparing to facilitate a workshop. Statements with particularly high agreement included adding interactive elements to keep participants involved throughout the workshop (94.6%) and applying effective facilitation skills to ensure effective delivery (93.5%). Statements with less agreement included incorporating graphics that illustrate the workshop's message (68.7%), illustrating the workshop's message through stories based on experience (62.6%), and using analogies to illustrate a workshop's message (61.9%).

Strategy-centric. Across position types, participants indicated that most statements were important when preparing for a training workshop. The following statements were agreed upon as more important when preparing to facilitate a workshop: incorporating activities that correspond with important workshop concepts (91.5%);

purposefully structuring content during a workshop (92.2%); and identifying appropriate learning activities to use during a workshop (94.2%). Also, two statements showed less agreement: using a tried-and-true method to structuring workshops (61.5%) and using a tried-and-true structure when building the workshop agenda (56.1%).

Model-centric. Participants' (overall) responses to these statements showed more variability compared to other statements. Statements gaining high agreement across position types included: helping participants connect workshop content to existing knowledge (89.5%); providing resources for participants to be used after the workshop (87.8%); supporting participants in applying what they have learned to their own context (84.7%); considering how participants will apply what they have learned after the workshop (83.7%); and incorporating debriefing questions (82.0%). Following up with participants after the workshop was not deemed as important for participants (51.4%). Formal educators were more likely to identify incorporating opportunities to provide feedback (82.0%) and coaching (82.0%) as important. Natural resource professionals were less likely to identify incorporating opportunities to provide feedback (50.0%) and coaching (56.5%) as important as well as including activities that help identify participants' existing knowledge (56.5%).

Table 3

Response Frequencies (Extremely Important and Very Important) by Centrism and Position Type

Centrism	Statement	Formal Educators (n = 50)	Natural Resource Professionals (n = 46)	Nonformal Educators (n = 139)	University Faculty (n = 53)	All (n = 294)
Media	Identifying the best way or approach to deliver the workshop (e.g. duration, in-person or online).	74.0	76.1	72.6	71.7	73.5
	Considering a variety of delivery approaches (e.g. duration, in-person or online) for the workshop.	84.0	63.1	62.6	60.4	66.3
	Integrating technology (i.e. smart phones, PowerPoint slides) in the workshop.	50.0	45.6	36.7	49.1	42.9
	Learning how to use a new technology (i.e. smart phone app like Google Field Trips) and integrating it into the workshop.	58.0	50.0	44.6	51.0	49.0
	Being knowledgeable about current and new technologies that can be used to help deliver a workshop.	70.0	63.1	56.8	60.4	60.9
	Finding and applying knowledge about current and new technologies to help deliver a workshop.	64.0	56.5	46.0	58.5	53.1
	Considering the features and benefits of a variety of delivery approaches (e.g. duration, in-person or online) before selecting one for a workshop.	78.0	67.4	57.6	60.4	63.3
	Considering the features and benefits of a technology before using it for a workshop.	68.0	78.3	62.6	62.3	66.3

	Selecting a delivery approach (e.g. duration, in-person or online) that I have experience with and feel comfortable with.	74.0	71.7	67.6	71.7	70.4
	Assessing and refining my use of current and new technologies to prepare for a workshop.	64.0	58.7	51.8	66.0	57.8
	Spending time to create or update materials for a workshop.	86.0	80.4	87.7	75.5	84.0
	Applying new, up-to-date approaches (e.g. duration, in-person or online) to deliver a workshop.	70.0	65.2	51.8	60.4	58.8
Message	Determining the best way to get the message, important concepts, or main ideas across during a workshop.	92.0	87.0	90.7	88.7	89.5
	Focusing on how I deliver important concepts, main ideas, or other parts of the message during a workshop.	90.0	84.8	84.9	81.1	84.7
	Incorporating graphics that illustrate the message, important concepts, or main ideas of the workshop.	74.0	73.9	64.0	69.8	68.7
	Including demonstrations that illustrate the message, important concepts, or main ideas during the workshop.	92.0	82.6	89.2	86.8	88.1
	Illustrating the workshop's message, important concepts, or main ideas through stories based on my own or others' experiences.	62.0	54.3	61.8	71.7	62.6
	Using analogies to illustrate the message, important concepts, or main ideas during the workshop.	68.0	63.1	57.6	67.9	61.9
	Identifying ways to gain the participants' attention throughout the workshop.	92.0	97.8	84.9	84.9	88.1

		Adding interactive elements to keep participants involved throughout the workshop.	92.0	95.6	96.4	92.5	94.6
		Learning from colleagues or other resources about the best way to deliver messages, important concepts, or main ideas effectively during the workshop.	78.0	84.8	81.3	73.6	79.6
		Focusing on how to make key message, important concepts, or main ideas "stick" during a workshop.	90.0	89.2	82.0	92.5	86.7
		Applying effective facilitation skills to ensure that the message, important concepts, or main ideas are delivered effectively.	94.0	91.3	96.4	88.7	93.5
		Identifying ways to focus participants' attention to the message, important concepts, or main ideas throughout the workshop.	88.0	80.4	80.6	84.9	82.7
	Strategy	Using a tried-and-true method to structuring workshops based on my experiences.	52.0	69.6	63.3	62.3	61.6
		Incorporating activities that correspond with important concepts during the workshop.	92.0	93.5	92.8	86.8	91.5
		Structuring workshops to include activities that emphasize specific topics or concepts.	84.0	82.6	88.5	81.1	85.4
		Applying knowledge of how people learn to the structure of workshops.	82.0	78.2	79.2	90.6	81.6
		Coming up with new ways to structure workshops to be more effective.	84.0	87.0	79.8	75.5	80.6
		Thinking about how people learn and applying that to the workshop's structure.	86.0	84.8	86.3	84.9	85.4
		Purposefully structuring content during a workshop so that it is easier for participants to learn.	86.0	91.3	95.0	94.3	92.2

	Model	Identifying appropriate instructional strategies for delivering workshops.	88.0	82.6	82. 8	86.8	84.4
		Identifying appropriate learning activities to use during the workshop.	94.0	97.8	95.0	90.5	94.2
		Using a tried-and-true structure when building the workshop agenda.	52.0	56.6	58.2	54.7	56.1
		Reusing a successful workshop structure for a future workshop.	70.0	76.1	77.0	72.6	75.2
		Reviewing participant evaluations and using feedback to improve the workshop structure.	82.0	80.5	83.5	84.9	83.0
		Considering how participants will apply what they have learned after the workshop.	90.0	84.8	79.1	88.6	83.7
		Providing participants with time to reflect about how they will use what they learn.	84.0	73.9	75.5	84.9	78.6
		Following-up with participants after the workshop.	60.0	52.2	48.2	49.0	51.4
		Providing resources and materials to participants for them to use after the workshop.	90.0	87.0	89.2	83.0	87.8
		Providing time for participants to reflect and plan how they will apply what they have learned.	82.0	76.1	72.7	81.2	76.2
		Supporting participants in applying what they have learned during the workshop to their own context.	94.0	82.6	81.3	86.8	84.7
		Incorporating debriefing questions to help participants connect what they have learned during the workshop to their own context.	88.0	82.6	78.4	84.9	82.0
		Helping participants connect workshop content to existing knowledge.	92.0	87.0	87.0	96.3	89.5
		Incorporating opportunities for me (or a co-facilitator) to provide feedback to participants	82.0	50.0	65.5	67.9	66.3

during the workshop.					
Incorporating opportunities for me (or a co-facilitator) to coach participants during the workshop.	82.0	56.5	55.4	67.9	62.2
Including activities that help me identify existing knowledge of participants.	76.0	56.5	70.5	79.3	70.7
Sharing additional resources with participants after the workshop.	74.0	80.5	72.7	77.4	74.8

Design approach by position type. A 4 x 4 ANOVA was conducted in order to understand the differences in self-assessment scores between design approach (media-, message-, strategic-, and model-centric) and position type (formal educator, natural resource professional, nonformal educator, and university faculty). The Levene's test of homogeneity was statistically significant $F(15, 1136) = 4.20$, $p < .001$. The results of the analysis indicated there was a significant main effect for position type, $F(3, 1136) = 7.85$, $p < .001$, $p\eta^2 = .020$ and for design approach, $F(3, 1136) = 27.24$ $p < .001$, $p\eta^2 = .067$. The interaction effect was not statistically significant for position type and design approach, $F(9, 1136) = 1.01$, $p = .429$, $p\eta^2 = .008$. Review Table 4 for a summary of this analysis of variance.

Table 4

Analysis of Variance for Design Approach Scores

Source	*df*	*F*	$p\eta^2$	*p*
Approach (A)	3	7.85	0.02	<.001
Position (P)	3	27.24	0.07	<.001
A x P	9	1.01	0.01	.43
S within group error	1136	(0.33)		

Note. The value enclosed in parentheses is the *mean square error*. S = subjects.

Given the statistically significant main effect for position type, the Tukey post hoc method of multiple comparisons identified a significant difference in scores between

formal educators and nonformal educators ($p < 0.05$) and between nonformal educators and university faculty ($p < 0.10$). For the statistically significant main effect of design approach, the Tukey post hoc method of multiple comparisons identified significant differences in scores between media-centric and message-centric ($p < 0.05$), strategy-centric ($p < 0.05$), and model-centric ($p < 0.05$); between message-centric and model-centric ($p < 0.05$); and between strategy-centric and model-centric ($p < 0.10$). There was no significant difference between message-centric and strategy-centric design approaches.

Distribution of preferred approach. Participants' responses were averaged by design approach to identify high scores, or preferences, for a given design approach. More than a quarter of participants (26.0%) identified more than one preferred design approach. Overall, 50.0% of participants indicated a preference for a message-centric approach followed by strategy-centric (41.0%), model-centric (34.7%), and media-centric (14.9%). When analyzed by position type, formal educators showed almost equal preference for message-centric (46.0%) and model-centric (48.0%) approaches. University faculty also indicated a higher preference (45.3%) for a model-centric approach over media- and strategy-centric approaches. Table 5 depicts a summary of these findings.

Table 5

Distribution of Preferred Design Approach (Centrism) by Position Type

Position Type	Media	Message	Strategy	Model

Formal Educator	14.0%	46.0%	38.0%	48.0%
Natural Resource Professional	15.2%	67.4%	43.5%	23.9%
Nonformal Educator	13.7%	45.3%	43.2%	29.5%
University Faculty	18.9%	50.9%	35.8%	45.3%
Across All Types	14.9%	50.0%	41.0%	34.7%

Research Question 2

This research question attempted to distinguish which learning design topics and skills should be included in the future professional development program for workshop facilitators. A series of 22 statements asked participants (n=308) about their interest in developing competency for learning design. Statements identified as extremely interested or very interested were included in the development of persona profiles.

Generic skills. Communicating effectively with others appeared to be of interest to participants across position types (65.9%). Formal educators and natural resource professionals expressed an interest in teaching others in an outdoor setting (80% and 80.4%), leading others (68% and 63.1%), and working with others as part of a team (74% and 60.9%). Topics that were of less interest (responses ranging from no interest to moderate interest) to participants included managing a professional development event (58.8%), planning a professional development event (56.8%), and budgeting costs for professional development events (55.5%).

Learning design skills. Participants expressed the most interest in creating learning experiences by applying an understanding of how people learn (66.6%) and

developing professional knowledge and skills as a reflective practitioner (64.3%). Formal educators were also more interested in identifying instructional strategies and learning activities for each learning outcome (64%) compared to natural resource professionals (56.5%), nonformal educators (51%), and university faculty (51%). Participants indicated less interest (responses ranging from no interest to moderate interest) for collecting and analyzing data about the needs of workshop participants (52.3%); writing objectives and learning outcomes for a workshop (61.7%); developing a strategy for the design of a workshop (55.2%); designing and applying quality assurance procedures (61.4%); applying knowledge of relevant legislation for such issues as accessibility and copyright, (66.2%); and applying knowledge of relevant ethical principles (63%). Formal educators expressed less interest developing strategies for assessing participants' knowledge (40%) and selecting from and applying a variety of assessment techniques (44%). Natural resource professionals expressed less interest in evaluating workshop outcomes (41.3%), and hosting and facilitating a workshop (45.6%). Both formal educators and natural resource professionals indicated less interest in collecting and analyzing data about workshop participants' current knowledge (42% and 41.3%).

Table 6

Response Frequencies (Extremely Interested and Very Interested) of Statements by Learning Design Skill and Position Type

Skill	Statement	Formal Educators (n = 50)	Natural Resource Professionals (n = 46)	Nonformal Educators (n = 139)	University Faculty (n = 53)	All (n = 308)
Generic	Managing a professional development event (i.e. workshop) from start to finish	46.0	47.9	40.2	35.9	41.2
	Planning a professional development event or workshop	54.0	47.9	39.5	39.7	43.2
	Teaching others in an outdoor setting	80.0	80.4	59.7	54.7	65.6
	Leading others	68.0	63.1	57.6	52.8	59.1
	Communicating effectively with others	68.0	80.4	63.3	62.2	65.9
	Working with others as part of a team	74.0	60.9	53.2	51.0	58.1
Learning Design	Budgeting costs for professional development events and workshops	52.0	32.6	47.5	35.9	44.5
	Creating a range of learning experiences (i.e. in-person workshop, webinar) that apply an understanding of how people learn	74.0	67.4	69.1	56.8	66.6
	Collecting and analyzing data about the needs of workshop participants	48.0	41.3	49.0	47.2	47.7
	Collecting and analyzing data about workshop participants' current knowledge	42.0	41.3	51.8	56.6	49.0
	Writing objectives and learning outcomes for a workshop	36.0	37.0	38.1	39.6	38.3

Developing a strategy for the design of a workshop	48.0	41.3	43.8	47.2	44.8
Identifying instructional strategies and learning activities for each learning outcome	64.0	56.5	51.0	51.0	54.9
Selecting from and applying a wide range of learning technologies (i.e. mobile app, PowerPoint slides) to use in a workshop	54.0	52.1	55.4	58.5	54.5
Developing strategies for assessing participants' knowledge	40.0	54.4	57.5	56.6	53.2
Selecting from and applying a variety of assessment techniques	44.0	52.2	52.5	52.8	50.0
Evaluating workshop outcomes	56.0	41.3	57.6	56.6	54.2
Designing and applying quality assurance procedures	32.0	30.5	41.0	41.5	38.6
Hosting and facilitating a workshop	52.0	45.6	50.4	49.1	49.7
Applying knowledge of relevant legislation for accessibility, plagiarism, copyright and intellectual property right issues, security, and confidentiality	36.0	19.5	32.4	45.2	33.8
Applying knowledge of relevant ethical principles and codes of practice	40.0	26.1	35.9	43.4	37.0
Developing my own professional knowledge and skills as a reflective practitioner	74.0	54.3	62.6	73.6	64.3

Research Question 3

A modified version of the Online Learner Self-Assessment attempted to answer this research question. Participants (n = 318) responded to 30 statements about the extent to which they agreed or disagreed about factors and abilities related to being prepared to participate in an online learning environment. Responses of strongly agree or agree were used to create the persona profiles for each position type.

Technology access. Across position types, participants overwhelmingly indicated that they have access to a fairly new computer (90.8%) with an Internet connection (99.4%). Regarding access to up-to-date software like Microsoft Office 2013, 11.3% disagreed with the statement although university faculty was less likely not have access (5.5%). Also, 13.8% of participants indicated they lacked access to a mobile device such as a tablet or smartphone with Internet connection.

Online skills and relationships. Participants believed they had the basic skills necessary to be successful using technology for online professional development. Nearly 100% of participants agreed they had the basic skills to operate a computer (99.4%), use the Internet (99.7%), send an email with an attachment (99.7%), and communicate clearly in writing (97.8%). Regarding other statements – i.e. feeling comfortable using a computer for professional development, communicate effectively with online technologies, etc. – also showed high agreement (>87%) although natural resource professionals and nonformal educators were more likely to report indifference (neutral) or to disagree (<10%).

Motivation. Participants generally felt confident in their ability to stay motivated to participate in an online professional development program. Formal educators were more likely to agree with being able to remain motivated even if colleagues were not online at all times (96%). However, participants (across position types) indicated they would be less likely to remain motivated when there were distractions at home such as television and children (17.2% disagreed or neutral).

Online audio/video. Overall, participants agreed with being able to learn through video and audio: 96.2% reported they would be able to relate content of short videos to other information; 94.7% said they could take notes while watching a video; and 96.2% indicated they would understand information presented in a video format.

Internet discussions. Compared to other statements, participants across position types appeared to be less confident in their ability to successfully participate in online conversations with their colleagues. For example, 12.3% of participants disagreed with being comfortable having multiple online conversations take place at the same time, and 7.5% disagreed with being able to follow along with online conversations. Natural resource professionals seemed most likely to be neutral in regards to participating in online conversations, and nonformal educators and university faculty were slightly more likely to disagree with these statements (except for preferring more time to prepare responses to online conversations).

Importance to your success. Participants generally agreed that technical and administrative support would be important to their success in an online professional development program (93.4%). However, participants were less likely to agree with

needing frequent interaction with colleagues in synchronous sessions (62.6%) or that frequent participation throughout the program was important to their success (82.7%). Natural resource professionals were less likely to agree that regular contact with an instructor was important for their success in learning online (63%), followed by nonformal educators (74.1%) and university faculty (84.9%); formal educators were much more likely to agree with that statement (93%). Nonformal educators and university faculty were more likely to indicate indifference regarding the importance of prior experiences with online technologies to their success (12.2% and 11.3%, respectively). Formal educators (12%), natural resource professionals (15.2%), and nonformal educators (15.1%) were more likely to express indifference regarding the need to immediately apply what they have learned as important to their success.

Table 7

Response Frequencies (Strongly Agree and Agree) of Statements by Online Readiness Factor and Position Type

Factor	Statement	Formal Educators (n = 50)	Natural Resource Professionals (n = 46)	Nonformal Educators (n = 139)	University Faculty (n = 53)	All (n = 318)
Technology Access	I have access to a computer with an Internet connection.	92.0	87.0	92.8	90.5	99.4
	I have access to a fairly new computer with satisfactory hardware (e.g. camera, speakers, enough RAM).	100.0	100.0	99.3	100.0	90.9
	I have access to a computer with up-to-date versions of common software (e.g. Microsoft Office 2013).	100.0	100.0	99.3	100.0	84.9
	I have access to a mobile device with an Internet connection (e.g. smart phone, tablet).	96.0	91.4	89.9	96.2	85.2
Online Skills, Relationships	I have the basic skills to operate a computer (e.g. saving files, creating folders).	96.0	95.6	84.1	94.3	99.4
	I have the basic skills to operate a mobile device (e.g. take photo or video, use apps).	96.0	91.3	92.9	94.3	91.8
	I have the basic skills for finding my way around the Internet (e.g. using search engines, entering passwords).	94.0	91.3	88.4	92.5	99.7
	I can send an email with a file attached.	94.0	89.2	85.6	84.9	99.7
	I think that I would be comfortable using a	100.0	97.8	97.2	98.1	92.8

		computer and/or mobile device several times a week to participate in professional development.					
		I think that I would be able to communicate effectively with others using online technologies (e.g. email, chat, social media).	96.0	89.1	86.2	84.9	90.3
		I think that I would be able to express myself clearly through my writing (e.g. mood, emotions, and humor).	92.0	95.7	90.7	88.6	93.4
		I think that I would be able to use online tools (e.g. email, chat, social media) to work on professional development with colleagues who are in different time zones.	88.0	78.3	81.3	86.8	90.9
		I think that I would be able to schedule time to provide timely responses to other colleagues.	98.0	97.8	95.0	96.2	87.1
		I think that I would be able to ask questions and make comments in clear writing.	98.0	95.6	90.0	100	97.8
	Motivation	I think that I would be able to remain motivated even though my colleagues are not online at all times.	100	95.6	93.6	98.1	87.4
		I think that I would be able to work on my professional development even when there are online distractions (e.g. friends sending emails or websites to surf).	92.0	93.5	83.5	90.6	90.6
		I think that I would be able to complete my work even when there are distractions in my home (e.g. television, children, and such).	88.0	80.4	74.8	77.4	82.7
	Audio, Visual	I think that I would be able to relate the content of short video clips (1-3 minutes typically) to other information I have	88.0	86.9	84.8	86.8	96.2

		learned.					
		I think that I would be able to take notes while watching a video.	88.0	84.8	89.2	88.7	94.7
		I think that I would be able to understand information when it's presented in video formats.	92.0	63.0	74.1	84.9	96.2
	Discussions	I think that I would be able to carry on a conversation with others using the Internet (e.g. chat, instant messenger, discussion board, social media).	74.0	52.2	54.6	69.8	88.4
		I think that I would be comfortable having several discussions taking place in the same online chat or discussion board even though I may not be participating in all of them.	98.0	87.0	92.9	96.2	78.6
		I think that I would be able to follow along with an online conversation (e.g. chat, instant messenger, discussion board, social media).	84.0	76.1	82.0	84.9	86.2
		I sometimes prefer to have more time to prepare responses to a question.	92.0	84.8	83.5	83.0	88.7
	Importance	Regular contact with an instructor is important to my success in online professional development.	88.0	80.5	81.3	86.8	78.3
		Frequent opportunities to interact with colleagues in "live" events (e.g. conference call, chat room) is important to my success in online professional development.	92.0	87.0	92.8	90.5	62.6
		Quick technical and administrative support is important to my success in online professional development.	100.0	100.0	99.3	100.0	93.4

Frequent participation throughout the learning process is important to my success in online professional development.	100.0	100.0	99.3	100.0	82.7
I feel that prior experiences with online technologies (e.g. email, chat, online readings, social media) are important to my success with online professional development.	96.0	91.4	89.9	96.2	85.5
The ability to immediately apply what I learn is important to my success with online professional development.	96.0	95.6	84.1	94.3	83.3

Research Question 4

Several multiple regression analyses were conducted for position type, education, number of workshops conducted, and years of experience to predict scores for design approach (media-, message-, strategy-, and model-centric). Education was defined as "1 = undergraduate-level work" and "2 = graduate-level work". Number of workshops conducted was defined as "1 = two or fewer" and "2 = more than two". Years of experience was defined as "1 = three or fewer" and "2 = more than three". A multiple regression analysis was conducted for each type of position type: formal educators, natural resource professionals, nonformal educators, and university faculty.

Media-centric. The F test for the regression model indicated that the prediction of design approach score for media-centric design approach was statistically significant for formal educators, $F(4, 277) = 3.58$, $p = .007$. Only 4.9% of variance in score for media-centric design approach was explained by variations in position type, education, number of workshops conducted, and years of experience. The regression equation for this data were: predicted media-centric design approach scores = 0.342*(position type) – 0.170*(education) – 0.052*(years of experience) – 0.125*(number of workshops) + 4.176. The results showed that the regression coefficient for position type (formal educator) was statistically significant ($p = .003$); all other regression coefficients were not statistically significant ($p > .05$).

The F test for the regression model indicated that the prediction of design approach score for media-centric design approach was also statistically significant for nonformal educators, $F(4, 277) = 3.65$, $p = .007$. Only 5.0% of variance in score for

media-centric design approach was explained by variations in position type, education, number of workshops conducted, and years of experience. The regression equation for this data were: predicted media-centric design approach scores = -0.260*(position type) – 0.173*(education) – 0.080*(years of experience) – 0.127*(number of workshops) + 4.412. The results showed that the regression coefficient for position type (formal educator) was statistically significant ($p = .002$); all other regression coefficients were not statistically significant ($p > .05$).

Message-centric. None of the multiple regression analyses for message-centric design approach scores were statistically significant.

Strategy-centric. None of the multiple regression analyses for strategy-centric design approach scores were statistically significant.

Model-centric. The F test for the regression model indicated that the prediction of design approach score for model-centric design approach was statistically significant for formal educators, $F(4, 277) = 2.70$, $p = .031$. Only 3.8% of variance in score for model-centric design approach was explained by variations in position type, education, number of workshops conducted, and years of experience. The regression equation for this data were: predicted model-centric design approach scores = 0.252*(position type) + 0.073*(education) – 0.035*(years of experience) + 0.003*(number of workshops) + 3.923. The results showed that the regression coefficient for position type (formal educator) was statistically significant ($p = .006$); all other regression coefficients were not statistically significant ($p > .05$).

Development of Persona Profiles

The data was further analyzed and synthesized to create persona profiles for each position type. These profiles depicted typical learners as reflected by demographic data as well as responses to the Design Approach Self-Assessment, Learning Design Skills Questionnaire, and the Online Learner Self-Assessment.

Formal educator. Martha Kensington began teaching almost 30 years ago. Growing up in a small town, she discovered how much she enjoyed teaching when she volunteered as a storybook reader at the local library. In college, Martha decided to enroll in a five-year program at State University to earn both her bachelor's and master's degrees in education. Today, 52-year old Martha teaches math to students attending Wilson Middle School in Clark County, a suburb of a major Midwestern metropolitan city. She also leads several student clubs and after school programs focusing on math and science.

Over the past decade, Martha has noticed that being a public school teacher has become increasingly more challenging. Her state recently adopted the Common Core State and now she is reviewing existing curriculum to ensure her students are learning what they need to in order to pass the standardized test at the end of the year. To help her meet new teaching standards, Martha often relies on existing supplemental curriculum activities from well-known providers.

Four years ago, Martha discovered an environmental education program through an in-service workshop hosted by her school's district. Unlike other teacher professional development experiences, this workshop was fun (they were outside for most of the

workshop). She also received a guide including almost 100 ready-to-use activities that met academic standards. Over the following year, Martha used these activities with her students and was pleasantly surprised at how much her students enjoyed doing them. She found the supplemental education materials so helpful that two years ago, Martha completed training to become a workshop facilitator for this environmental education organization.

In these workshops, Martha gets to meet other educators and show them how to use the activities to supplement their own curriculum while meeting state standards. Being a teacher with many years of experience, Martha feels very comfortable planning and facilitating these workshops. For instance, she knows how to assess workshop attendees' knowledge prior to the event and develop a strategy for the workshop. Martha can also manage the workshop itself rather well. However, sometimes Martha doesn't feel comfortable taking her workshop outdoors and would like more opportunities to practice that skill. Unfortunately, this past year has been very busy and she hasn't conducted a workshop in over 12 months.

Being a teacher, Martha must complete continuing education units (CEUs) every year to maintain her certification. Some of these professional development events have been in-person workshops like the one hosted by her school district. Other events have been online through one of the many programs offered through the state's public and private colleges. She also actively participates in less formal peer-to-peer learning activities available through a professional learning community at her school. Martha feels very comfortable learning in an online environment, and already works to stay on top of

emerging technologies and keeps her personal devices up-to-date. However, she misses the opportunities to interact with other educators face-to-face and prefers those interactions to asynchronous online conversations.

Martha's goals include:

- *Effectively teach students math while also meeting her state's standards for education.* Martha is constantly looking for new ways to support her teaching in order to help her students be successful and pass annual state assessments.
- *Meet other educators who use the same types of supplemental curriculum materials.* Martha enjoys getting to know other educators and discuss ideas for supplementing her existing curriculum materials, such as with the environmental education activities.
- *Being "in the know" as member of the workshop facilitator network for this environmental education organization.* Martha may not be active as a workshop facilitator right now, but she enjoys getting regular communications from the environmental education organization about events that are happening around her state.

Table 8

Persona Profile Summary for Formal Educator

Criteria	Description
Name	Martha Kensington

Age	52 years
Location	Suburb of major Midwestern city
Education	Master's degree in education
Profession	Middle school math teacher
Experience with Organization	4 years
Facilitation Experience	2 years
Workshops Conducted (recent 12 months)	None
Goals	Effectively teach students math while also meeting her state's standards for education Meet other educators who use the same types of supplemental curriculum materials Being "in the know" as a member of the workshop facilitator network for this environmental education organization
Key Characteristics	Values ready-to-use activities that correlate to state standards Feels very comfortable facilitating workshops because of her many years of teaching experience Interested in learning how to be more comfortable teaching others outdoors Has access to technologies, uses them, but also values person-to-person interactions such as through a professional learning community

Natural resource professional. More than 25 years ago, Winston Mitchell began working for his state's Department of Natural Resources right out of college with a bachelor's degree in forestry. He had no idea that this job would become his career, or that he would enjoy the wide range of responsibilities associated with working for a small state-run government agency. Now 48 years old, Winston and his family live only a few

miles away from his office located in a rural part of the state and only about an hour away from the nearest city.

In addition to working with private land owners about land management, Winston's role at the Department of Natural Resources includes community outreach and education. It is through this work that Winston educates the public about trees as a renewable resource that is important for the creation of everyday products and is a contributor to clean air and water. He works with local organizations to create publications focusing on wildlife and plants native to the state, and frequently co-sponsors community projects striving to conserve the natural landscape. Often, Winston attends community events representing his state agency and hosts educational events for teachers and students.

Leading environmental education programs is Winston's favorite part of his job. He believes that getting children outside is important to helping them learn about the value of trees. When he started with the state Department of Natural Resources, he became trained in several environmental education programs so that he could teach children. About 12 years ago, Winston was certified to train others in using three specific environmental education programs. Most of these workshops that Winston facilitates focus on using trees as a tool for education and preparing teachers to use supplemental curriculum materials with their students. He uses materials from all three environmental education programs during a single workshop so that educators leave feeling prepared to start using the activities in their classrooms.

Being an experienced workshop facilitator, Winston feels confident in his ability to deliver a great workshop. After all, the teacher comments on the post-workshop survey almost always say positive things about the experience! When he prepares for a workshop, Winston often will pull up the agenda he used last time for a similar topic and audience, and make small adjustments. However, Winston hasn't yet embraced using technologies in his workshops and is still figuring out how best to do just that. One reason for his inaction in integrating technologies is that he hasn't hosted a workshop in the past year, largely in part due to budget cuts and redistribution of responsibilities within the Department of Natural Resources.

Every year, Winston identifies "ongoing professional development" as a personal goal to support his work for the state agency. If you asked him, Winston would identify for his own professional development more opportunities to teach outdoors and build camaraderie with people he works with on a regular basis. However, most of the professional development events that Winston attends focus on new policies or procedures. More often than not, these events are webinars delivered by another state or federal agency. Winston feels comfortable using his computer for webinars, although sometimes the computer acts difficult or the Internet connection becomes unreliable. For these reasons, Winston prefers not to watch streaming videos at work or other Internet-based tools such as social media. Also, his job frequently keeps him out of the office and away from a computer to participate in online conversations.

Winston's goals include:

- *Support the state's Department of Natural Resources goals of community outreach.* Winston believes that the work he does in the local community to support environmental education and initiatives make a positive impact on his state agency's efforts to educate the public about the value of trees as a renewable resource.
- *Meet with local educators and support them in implementing environmental education in their classrooms.* Winston enjoys teaching others about environmental education and sharing the many resources available with teachers so that they can do fun, outdoor activities with their students while also appreciating trees.

Table 9

Persona Profile Summary for Natural Resource Professional

Criteria	Description
Name	Winston Mitchell
Age	48 years
Location	Rural Northeast
Education	Bachelor's degree in forestry
Profession	State Department of Natural Resources
Experience with Organization	23 years
Facilitation Experience	12 years
Workshops Conducted (recent 12 months)	None

Goals	Support the state's Department of Natural Resources goals of community outreach
	Meet with local educators and support them in implementing environmental education in their classrooms
Key Characteristics	Very experienced in facilitating environmental education programs, feels confident in being able to deliver a good experience
	Prepares for workshops by updating the most recent version of the workshop agenda
	Doesn't really use technology in workshops
	Interested in more opportunities to teach outdoors and collaborate with team members
	Work technology is reliable most of the time

Nonformal educator. Ana Figueroa enjoys learning about the natural environment and teaching others how to be responsible stewards of the environment. When she was an undergraduate student at State University, Ana knew that she wanted to work with children and so she found a job in an afterschool program that focused on teaching children science and math through nature. The program director was impressed with Ana and convinced her to earn a master's degree in environmental education. Now, 34-year-old Ana works at the city's largest nature center. Every day Ana has the opportunity to teach students and other members of the community about the local natural environment.

At the nature center, Ana spends much of her time putting together educational programs. During the week, these programs focus on students visiting from nearby schools. Ana works with the students' teachers to identify activities that complement whichever unit or topic the students are currently studying. Over the holidays and

weekends, Ana sometimes hosts events for families wanting to explore local wildlife in a child-friendly place. Ana is also responsible for preparing materials that support these educations programs such as pamphlets, field guides, and printed resources. To create these materials and plan education programs, Ana uses environmental education activities from several providers. She has seen first-hand how effective these activities are in engaging students and getting children outside to explore the natural environment. Ana was first introduced to these materials about 12 years ago in one of her undergraduate classes in environmental science, and has been using them ever since.

About three years ago, Ana began facilitating workshops to show teachers how to use these supplemental environmental education materials with their students. Just as with the programs for children, Ana really enjoys planning each teacher workshop and thinking about how to make it a great experience. It is not uncommon for Ana to browse online resources and social media forums for new ideas that get teachers excited about environmental education. After a workshop, she always reads the survey comments from teachers and hopes for suggestions to make the workshop even better next time. However, it has been almost six months since the Director of the nature center asked Ana to facilitate a teacher workshop because of a "change in priorities" for the current year.

As a nature center employee, Ana's experience with professional development has been limited to topics new to the nature center or to the field of environmental education. For example, Ana and her coworkers will participate in an in-person session with an expert whenever a new exhibit opens at the center. Only a few times has Ana been asked to participate an online professional development event such as listen to a

webinar recording. When she was in college, Ana took a few online classes and feels comfortable using technology for learning. On the job, however, Ana is so busy all day long that the idea of joining a synchronous learning event seems difficult. If the Director could give her some time each week, however, maybe Ana would be able to participate in webinars, discussion forums, or other online learning events.

Ana's goals include:

- *Support the mission and goals of the nature center by educating the public about the environment.* Ana's work contributes to the mission of the nature center, and through that work Ana strives to help make the center successful.
- *Work for an organization that matches her personal and professional goals of being an environmental educator.* Ana is happy to have found a job that allows her to do what she enjoys most – teach others about the environment.

Table 10

Persona Profile Summary for Nonformal Educator

Criteria	Description
Name	Ana Figueroa
Age	34 years
Location	Mid-sized Southeastern city
Education	Master's degree in environmental education
Profession	Nature center staff
Experience with Organization	12 years

Facilitation Experience	3 years
Workshops Conducted (recent 12 months)	1
Goals	Support the mission and goals of the nature center by educating the public about the environment
	Work for an organization that matches her personal and professional goals of being an environmental educator
Key Characteristics	Is passionate about environmental education and working with children
	Spends most of her time developing programs for children and families
	Wants to be creative with workshops and constantly looks for ways to improve each experience
	Too busy to participate in synchronous learning events, unless her Director can give her more time for professional development

University faculty. For many years, Sasha Coakley taught second graders at a small school in the city. It was in that job that Sasha first started using environmental education activities to supplement her teaching curriculum. She found that students loved going outside and learning from nature. Fifteen years ago, Sasha decided she needed a change and went back to school. Sasha completed her Ph.D. at State College and moved on to her next career: teaching preservice teachers at a small college located on the outskirts of a mid-sized city. At 65, Sasha has the opportunity every day to work with and prepare the next generation of teachers.

During the year, Sasha works with 20 to 30 undergraduate students enrolled in the university's teacher preparation program. Depending on the year, she may teach up to 10 graduate students as well. Sasha's teaching experience has shown her that including

environmental education activities in her curriculum help students learn important concepts in science and math through hands-on learning experiences. Some environmental education materials – particularly the supplemental materials provided by several well-known nonprofits – also provide clear connections to national standards of learning, like Common Core and Next Generation Science Standards. For a new teacher in the classroom, these ready-to-use (and high quality) materials are a godsend! It is for these reasons that Sasha ensures that each of her students has an opportunity to obtain supplemental environmental education materials and learns how to integrate them with existing curriculum.

In the fall and spring semesters, Sasha facilitates a workshop for her preservice undergraduate and graduate students that provides opportunities for them to see the environmental education activities in-person. Because she conducts the workshops as part of a college course, Sasha generally is not concerned about the logistics of the workshop such as management, budgeting, or planning. To prepare, Sasha identifies four to five activities that she believes the students would find valuable. During the workshop, Sasha models the activities and requires that the students plan and reflect on how they might make them "their own". She hopes that her students will become reflective practitioners so that when they become teachers, they can easily adapt their curriculum to meet the ever-changing needs of young learners.

Being a professor at a well-regarded college means that most of Sasha's professional development experiences focus on research in teacher education. Each year, Sasha attends two or three major conferences and a few local, regional meetings. She sees

these events as opportunities to network with other researchers in the field of teaching, as well as to learn about cutting-edge approaches in teacher education. Overall, Sasha enjoys learning in a face-to-face environment instead of through a completely online program. Her department provides faculty with a relative new computer and tablet (if requested) to use for teaching, and other work tasks such as professional development. Her experience in learning online has been limited to completing annual online training required by the college's information technology department and ethics board. These asynchronous experiences can be done whenever Sasha had a few moments, which fit her usually busy schedule. However, she rarely participates in the discussion forums or other online conversations that usually accompany those training events.

Sasha's goals include:

- *Prepare future teachers to be successful in the classroom.* Sasha plans her classes (and workshops) with the intent to encourage adaptability and reflection in her preservice students, skills that Sasha believes are important for an effective teacher.
- *Share tools, tips, and tricks gained from life experience to help teachers be prepared for teaching.* Sasha wants to share her life experience, and that includes teaching materials (such as environmental education activities) that have proven useful in the classroom.

Table 11

Persona Profile Summary for University Faculty

Criteria	Description
Name	Sasha Coakley
Age	65 years
Location	Outskirts of a mid-sized Pacific Northwestern city
Education	Ph.D. in education
Profession	College professor for preservice students
Experience with Organization	18 years
Facilitation Experience	9 years
Workshops Conducted (recent 12 months)	2
Goals	Prepare future teachers to be successful in the classroom Share tools, tips, and tricks gained from life experience to help teachers be prepared for teaching
Key Characteristics	Experienced teacher, and now a teacher of teachers Strives to prepare preservice teachers to be successful in the classroom by encouraging reflection and adaptability Doesn't spend much time on managing, budgeting, or planning each workshop Has a new computer and tablet to support her work at the college Limited experience with online learning, prefers face-to-face interactions such as those at conferences

Chapter Five

Due largely in part to the rise of self-service technologies and the marginalization of professional instructional designers, organizations increasingly rely on designers-by-assignment to create instructional materials and facilitate learning experiences. Designers-by-assignment are typically individuals with subject-matter expertise asked by their organization to design and develop training materials as an additional task required of their job (Merrill, 2007). Designers-by-assignment generally have not been trained in instructional design nor do they recognize themselves as practicing instructional design. For organizations who rely on designers-by-assignment to train their staff, create job aids or training manuals, host a webinar, or design an online tutorial, there is a concern about the quality of these learning experiences and the degree to which they support employee and organizational performance. For these reasons, professional development opportunities are needed to guide these individuals in applying best practices.

The present study investigated the learning needs of workshop facilitators (designers-by-assignment) by conducting a learner analysis as the first iteration of an extensive design-based research project leading to the creation of an online professional development program supporting the goals of a nation-wide environmental education program. The learner analysis consisted of three instruments in addition to demographic questions: Design Approach Self-Assessment (based on Gibbons, 2003); Learning

Design Skills Questionnaire (based on MacLean & Scott, 2011); and Online Learner Self-Assessment (modified from Watkins, Leigh, & Triner, 2004). The data were analyzed from the perspective of four position types (formal educators, natural resource professionals, nonformal educators, and university faculty) in order to assist in the development of persona profiles. This section discusses key findings and makes recommendations for the design of a professional development program for workshop facilitators as well as suggestions for future research.

Conclusions

Analysis of data and the development of persona profiles yielded findings important for the design of a future online professional development program for workshop facilitators.

Demographics. Overall, participants were highly educated (more than 90% have earned a bachelor's degree or higher) compared to the rest of the population (approximately 30% according to the U.S. Census Bureau, 2014). This finding suggested that workshop facilitators have experience and likely some degree of competency for reading, writing, and other communication skills, and may in part be why participants feel comfortable and motivated in an online professional development program (per high level of agreement indicated on the Online Learner Self-Assessment).

Workshop facilitators were older than expected. Fewer than 20% of respondents were Millennials (between 18 and 34 years of age) compared to rest of the workforce where Millennials now represent the majority, according to the Pew Research Center (Fry, 2015). This may be because these professions – formal educator, natural resource

professional, and university faculty – generally attract career-minded individuals likely to stay in their profession longer than others.

A startling finding was that workshop facilitators conduct far fewer workshops than expected. Approximately 40% reported conducting no workshops in the last year, and just as many indicated they conducted only one or two in the previous 12 months. This finding represented a rather huge obstacle for the design of a professional development program. Without opportunities to apply what is learned, it is unlikely that workshop facilitators will change their own behaviors.

Design approach. Participants did not appear to differ in how they approach workshop planning and facilitation, despite differences in background including education level, years of facilitation experience, and position type. The ANOVA hinted at some differences although the small effect sizes suggested that very little of that difference could be attributed to design approach or position type. The post hoc analyses showed that workshop facilitators might be more message- and strategy-centric in their approach rather than media- or model-centric. When reviewing the overall distribution of high scores across position types, participants indicated a strong preference for a message-centric approach followed by a strategy-centric approach.

Learning design skills. Several learning design skills emerged from the data as of interest to workshop facilitators in an online professional development program. The top four skills identified for workshop facilitators (all above 60% indicating extremely or very interested) were: creating a range of learning experiences that apply an understanding of how people learn; communicating effectively with others; teaching

others in an outdoor setting; and developing my own professional knowledge and skills as a reflective practitioner.

Also, workshop facilitators identified which learning design skills were of less interest. The bottom four skills (all below 40% indicating extremely or very interested) were: designing and applying quality assurance procedures; writing objectives and learning outcomes for a workshop; applying knowledge of relevant ethical principles and codes of practices; and applying knowledge of relevant legislation for accessibility, plagiarism, copyright and intellectual property, security, and confidentiality.

Online learning readiness. Overall, workshop facilitators believed they were ready to learn in an online environment. Participants felt confident in their access to modern technology, ability to do basic tasks using the Internet, forming relationships with colleagues, being motivated to participate, learning through audio and visual media, and discussing topics with colleagues. More than half of the statements had agreement from 90% or more of participants. Three statements had less than 80% agreement: I think that I would be comfortable having several discussions taking place in the same online chat or discussion board even though I may not be participating in all of them; regular contact with an instructor is important for my success in online professional development; and frequent opportunities to interact with colleagues in "live" events is important for my success in online professional development.

Discussion

This section reviews each research question addressed by the present study and discusses the ways in which findings are consistent with the literature, met expectations, and what was learned.

Research question 1. *Do designers-by-assignment differ in their approach to the instructional design process?*

Developing expertise in a profession requires deliberate practice (Ericsson, 2006b) supported by self-regulatory behaviors (Kitsantas & Dabbagh, 2010) and self-motivating beliefs (Zimmerman, 2006). While many studies (Le Maistre, 1998; Perez, Johnson, & Emery, 1995; Rowland, 1992) have illustrated characteristics of novice and expert instructional designers (individuals on either end of the expertise development process), only Gibbons (2003) attempted to describe what development might look like for those studying instructional design. He observed that instructional design students changed in their focus from media selection, to message delivery, to instructional strategy, and finally to the learning system as their knowledge and experiences grew over time. For example, a less experienced instructional designer likely would be captivated more by the technology used to develop learning experiences (media-centric) compared to a more advanced student who would emphasize the system of learning supporting the instructional event (model-centric). Alternatively, the current focus of an instructional designer – media-, message-, strategy-, or model-centric – may be indicative of where he or she is in their development of instructional design expertise. With that information in

hand, the appropriate scaffolding and professional development activities could be designed to support their further development.

The present study attempted to discern the focus (media-, message-, strategy-, or model-centric) of informal practitioners of instructional design – referred to as designers-by-assignment in the literature (Merrill, 2007) – by asking workshop facilitators which tasks they considered most important when planning and facilitating a training event. Analyses suggested that there is little difference in how these designers-by-assignment approach the design process despite differences in education/training and years of experience as captured by each position type: formal educator, natural resource professional, nonformal educator, and university faculty. For example, it was expected that university faculty (56.6% have a PhD; 39.6% with more than ten years of workshop facilitation experience) would demonstrate greater tendencies for model-centric beliefs, and nonformal educators (10.1% with more than ten years of experience) would be more media- and message-centric. However, scores across position types were similar with a greater tendency to prefer a message-centric approach (as shown by the overall distribution of high scores) followed by a strategic-centric approach (natural resource professionals and nonformal educators) or a model-centric approach (formal educators and university faculty). This finding supported the literature suggesting that years of experience alone are not sufficient to build expertise (Ericsson & Lehmann, 1996).

Perhaps one reason why workshop facilitators did not show a difference in design approach arose from participants' lack of opportunity to practice the skills required to plan and facilitate a workshop. More than 80% of participants reported that they

conducted two or fewer workshops in the past year. To develop expertise, an individual requires opportunities to deliberately practice a skill and receive feedback (Ericsson, 2004). Without those opportunities, a workshop facilitator might stagnant in his or her skill development or rely on routine practice to plan a workshop when it is needed. For the workshop facilitators in the present study, their skill development may have never grown beyond 'novice' and further research would be needed to identify the extent to which workshop facilitators behave as novice instructional designers. This finding regarding the lack of practice opportunities also has important implications for the design of a professional development program to support designers-by-assignment – how can designers-by-assignment practice and improve their skills when there are few (if any) opportunities to apply what they have learned?

Research question 2. *Which learning design competencies do designers-by-assignment identify as of interest for inclusion in their professional development?*

In the field, professional instructional designers can use established competency models to identify goals for deliberate practice and work toward skill improvement (Munzenmaier, 2014). The literature offers several competency models developed by prominent professional organizations (i.e. ASTD, IBSTPI, and ISPI). However, to use these models requires that the individual first recognize himself or herself as a practitioner of instructional design – a realization unlikely to be made by a designer-by-assignment. Therefore, the present study developed statements based on MacLean and Scott's (2011) framework to provide workshop facilitators with the opportunity to reflect

on their learning needs and identify which competencies they believe should be included in a professional development program.

An analysis of workshop facilitators' responses identified skills that interested (and did not interest) participants for inclusion in their professional development. Participants agreed that learning how to create "a range of learning experiences that apply an understanding of how people learn" interested them as well as communicating effectively with others, teaching in an outdoor setting, and developing professional knowledge and skills as a reflective practitioner. 'Communicating effectively with others' matches one of the competencies identified for designers-by-assignment by Rozitis (2014) and Wills-Espinosa (2014). These competencies encompass a rather broad application of skills that do not necessarily pertain directly to the process of designing, planning, and facilitating a workshop. This finding was further evidenced by one of the least interesting competencies identified by participants: writing objectives and learning outcomes for a workshop – a competency that is at the foundation of instructional design practice. (Over the past year, the national organization hiring/sponsoring these workshop facilitators has been pushing an initiative focusing on writing objectives and outcomes for workshops. Yet, this competency is still considered of little interest to the larger network of workshop facilitators.) It seems that participants are interested in improving their skills as an instructional designer-by-assignment but might not realize what that process entails. Also, this may represent an attitudinal barrier to overcome through the design (and later implementation) of an online professional development program.

Other competencies that were indicated as less interesting to workshop facilitators included: designing and applying quality assurance procedures; applying knowledge of relevant legislation for accessibility and other laws; and applying knowledge of relevant ethical principles and codes of practice. This finding was unsurprising because these competencies often hold low importance for the majority of professional instructional designers. Regardless, the literature views these competencies as important for instructional designers-by-assignment (i.e. Rozitis, 2014; Wills-Espinosa, 2014), and they are included in competency models developed by prominent organizations (i.e. IBSTPI).

Research question 3. *To what degree do designers-by-assignment recognize themselves as ready to learn in an online environment?*

Although the modern workplace often includes a variety of technologies, individuals may or may not demonstrate the wide range of knowledge and abilities needed to use them. The original version of the Online Learner Self-Assessment (Watkins, Leigh, & Triner, 2004) posed the question to potential college students (a formal professional development experience) asking, are you ready to learn in an online environment? For the present study, this tool was modified and updated to be used for considering technologies and individuals' comfort with technologies for learning in a nonformal professional development program. Overwhelming, participants indicated that, yes, they were ready to learn in an online environment. Workshop facilitators reported having access to basic (and up-to-date) technologies such as a computer with Internet connection and a mobile device. More importantly, workshop facilitators felt comfortable in their ability to complete basic tasks using these technologies, such as sending an email

with an attachment, searching the Internet, and having conversations with others. Also, responses suggested that participants believed they can effectively perform tasks that would support their learning such as watching videos and take notes, asking questions, and communicating well with others who might respond at different times of day. Despite being comfortable with these skills, participants also believed that administrative and technical support would be important to their success. However, regular contact with an instructor and participation in "live" learning events were identified as less important to their success.

These findings generally met expectations although the high percentage of agreement was less expected. For example, more than half of the statements received over 90% agreement from participants, and all but three statements had 80% or more agreement. The nuances of responses, however, were less surprising. For example, a higher percentage of formal educators and university faculty agreed they have access to a mobile device compared to the other position types. It would be expected that formal learning environments are more likely to provide those tools. Overall, this network of workshop facilitators appeared to have access to learning technologies, was comfortable working with technology, and was generally ready to learn in an online environment. The findings from the Online Learner Self-Assessment will prove helpful in designing an online professional development program for workshop facilitators.

Research question 4. *Is there a relationship between approach to instructional design process, learning design competencies, abilities in using online tools, factors important to online success, and demographic information?*

In addition to analyses of each survey instrument component (Design Approach Self-Assessment, Learning Design Skills Questionnaire, and Online Learner Self-Assessment), the research examined the relationships between these data and demographic information. Although the results of the multiple regression analyses identified some statistically significant relationships, little could be inferred. For example, results suggested that the design approach model-centric score for a formal educator could be predicted using a regression model. However, little of the variance could be attributed to the factors included in this model: position type, education, number of workshops conducted, and years of experience. Likely, the reason for the murkiness of results can be attributed to the choice of variables to be included for analysis. To use categorical data as a dependent variable for regression, the variable must be dichotomous (Dimitrov, 2008). In order to conduct this series of analyses, variable responses were forced into dichotomies, which do not reflect best practices and likely contributed to the unclear findings.

Recommendations

With the study's findings in mind, this section discusses implications for the field of instructional design and how organizations can support designers-by-assignment. It also identifies features and design considerations for the creation of an online professional development program for workshop facilitators (designers-by-assignment). Finally, suggestions for future research of designers-by-assignment are discussed.

It is worth noting that the participants in the present study depicted a specific type of designer-by-assignment, workshop facilitators, whose primary focus was to design and

facilitate workshops for environmental educators. Generally speaking, these individuals are responsible for planning the workshop (i.e. reserving the location, obtaining supplies, scheduling), building an agenda for the event, and facilitating it. Compared to other designers-by-assignment, these workshop facilitators work in varying contexts (schools, nature centers, universities), have access to different resources, and may have differing requirements in designing learning experiences. For these reasons, the recommendations discussed here may have limited generalizability to other populations of designers-by-assignment.

Regarding the practice of instructional design. For those who formally practice instructional design, the challenge with designers-by-assignment often stems from the fact that many do not realize that they are also practitioners of instructional design or even that the field of instructional design exists. Some of the findings in the present study pointed to this knowledge gap. For example, participants showed interest in learning how to create learning environments but were less interested in writing learning objectives and outcomes, a key task in the practice of instructional design. For organizations that rely on training and development programs for their success, awareness of instructional design and application of best practices becomes imperative for helping them meet their bottom line.

The literature offers several suggestions for supporting designers-by-assignment in practicing effective instructional design. Practitioners of instructional design have authored 'how to' types of publications targeting the population of 'accidental' instructional designers (i.e. Bean, 2014; Williams, 2008). Others have recommended that

organizations assign an instructional designer to support designers-by-assignments (Pesce, 2012) or encourage managers to take responsibility for their professional development (Kim, Lee, Merrill, Spector, & van Merrienboer, 2008). When an instructional design resource is available, these solutions may make sense especially if designers-by-assignment do not practice instructional design frequently enough to encourage deliberate practice and skill development. An instructional design resource or manager can offer additional scaffolding to help the designer-by-assignment be successful. However, this approach largely places the responsibility for the designer-by-assignment onto that of the professional instructional designer overseeing his or her performance.

Alternatively, a professional development program requires that the designer-by-assignment take more responsibility for their role as an instructional designer and can be a better solution for an organization with a large number of designers-by-assignment. (For example, the organization in the present study would require a large team of instructional designers to support the more than 1,000 designers-by-assignment.) However, Carliner and Driscoll (2009) noted that professional development programs for designers-by-assignment are far and few between. As illustrated by the findings of the present study, a professional development program might address topics related to specific instructional design competencies and incorporate a variety of learning experiences mediated by an array of available technologies.

For a professional development program to be successful, however, participants need frequent opportunities to learn best practices and apply that knowledge. Through

professional development experiences, designers-by-assignment can identify personal goals and work toward those goals. Without opportunities for practice, designers-by-assignment likely will not develop the skills needed to improve their performance. In other words, inviting a designer-by-assignment to facilitate a workshop two times per year is not sufficient to garner the development of expertise within the field of instructional design. Instead, this designer-by-assignment likely would better benefit from heavy scaffolding in the form of job aids and checklists. Figure 3 summarizes these recommendations by showing the relationship between the number of opportunities for deliberate practice and the degree to which a designer-by-assignment benefits from scaffolding and/or professional development experiences.

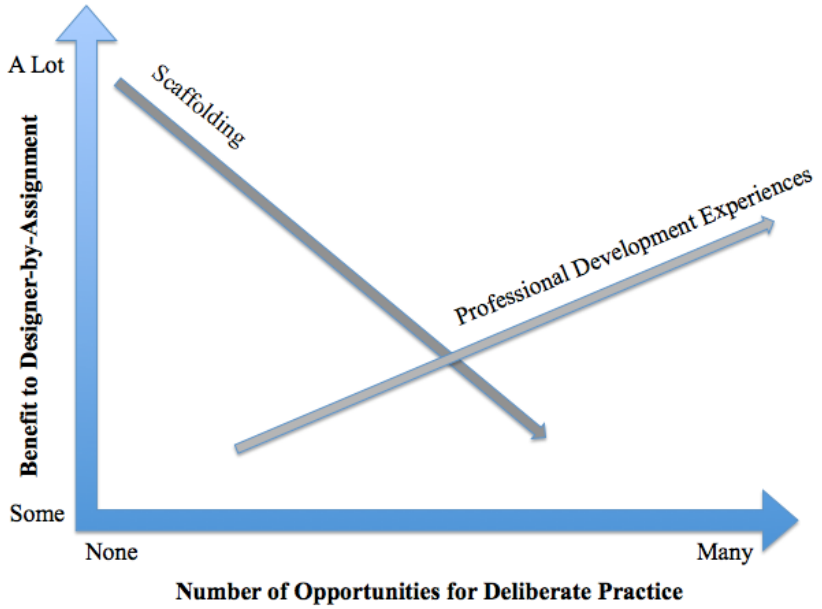

Figure 3. Opportunities for deliberate practice and benefit to designer-by-assignment for scaffolding and professional development experiences.

Regarding the design of online professional development. The overarching goal of this study was to collect data regarding the learning needs of a specific population of designers-by-assignment, workshop facilitators, with the intent to use that information to support the design of a professional development program. The findings of this learner analysis pointed to three categories of recommendations: considerations for the existing network of workshop facilitators, design features for ongoing professional development experiences, and considerations for the implementation of a program.

***Network*.** The population of workshop facilitators investigated in this study represented a critical component in helping the organization achieve its goals. Like designers-by-assignment in other organizations, these individuals participated in instructional design activities as only a small part of their regular job. However, perhaps the most surprising and unexpected finding identified was just how often they did this: the vast majority of workshop facilitators conducted two or fewer workshops in the previous 12 months, and approximately 40% of participants reported not conducting a workshop at all. This finding questions the need for an extensive network (over 1,000 designers-by-assignment). From a practical standpoint, a smaller network would require fewer financial resources to support the implementation of a professional development program. Also, individuals who conduct frequent workshops likely would be more motivated and personally invested in improving their instructional design skills.

For the reasons stated above, it is recommended that the organization reevaluate the current processes associated with becoming a workshop facilitator and maintaining that status. More specifically, workshop facilitators should take more ownership of their

status. To become a workshop facilitator, for instance, the process should include a certification process that includes completing a series of training experiences that focus on competencies needed to be successful as well as best practices. While a performance assessment may or may not be realistic for this population given time and resource constraints, it is highly advised that certification include an opportunity for the workshop facilitator to conduct a workshop and receive feedback from an experienced workshop facilitator. In addition to setting up the newly certified workshop facilitator for success in this new role, this opportunity also capitalizes on the experience and knowledge of existing workshop facilitators as experts and possible mentors. Finally, certified workshop facilitators should be required to maintain their status by conducting so many workshops per year (it is recommended that at least four although this number might not be reasonable for every state program) and completing professional development hours including participation in learning experiences offered through the new online professional development program. For workshop facilitators who are unable to maintain their certified status, it is important not to alienate these individuals and suggests that the network structure include a sub-status that allows workshop facilitators to be inactive but still encourage other types of involvement.

Design features. The data collected through the learner analysis yielded several findings with implications for the design of a professional development program for workshop facilitators. Table 11 summarizes these findings and offers recommendations for design. Some of the design recommendations reiterated specific interests or concerns voiced by participants (i.e. offer focused experiences about teaching others outdoors

because this competency was more interesting to participants). Other design recommendations reflected initial interpretation of the data (i.e. develop scaffolding to support workshop facilitators when they conduct a workshop because the vast majority have very few opportunities to practice instructional design skills). In the tradition of design-based research, these design recommendations will be used to later develop a prototype of the professional development program (specifically, learning materials and the online learning platform) that subject-matter experts will review through several iterative cycles until it is ready for implementation with that larger network of workshop facilitators.

Table 12

Summary of Findings and Design Recommendations

Source	Finding	Design Recommendation
Demographics	The vast majority of workshop facilitators conduct two or fewer workshops per year	Develop scaffolding to support workshop facilitators when they do conduct a workshop, such as job aids, 'how to' guides, and checklists
Design Approach Self-Assessment	Workshop facilitators appear to prefer a message-centric approach to planning and facilitating workshops	Provide learning experiences that build upon the preference for message-centric approaches in order to support personal development toward strategy- and model-centric approaches
Learning Design Skills Questionnaire	Workshop facilitators are interested in learning how to create a wide range learning experiences that apply an understanding of how people learn	Offer examples of well-designed workshops that demonstrate different types of learning experiences
	Workshop facilitators are interested in learning how to communicate effectively with others	Include opportunities for workshop facilitators to reflect on their own communication skills, and practice with others
	Workshop facilitators are interested in learning how to better teach others in an outdoor setting	Offer focused experiences about teaching others outdoors and include opportunities to practice this skill with feedback from others
	Workshop facilitators are interested in developing their own professional knowledge and skills as a reflective practitioner	Include frequent opportunities for workshop facilitators to reflect on their own their own skills, knowledge, and abilities

	Workshop facilitators are not as interested in learning how to writing objectives and learning outcomes for a workshop, suggesting there may be an attitudinal barrier	Emphasize the importance of objectives and outcomes by offering examples, modeling their use, and tying back to topics that are of interest to workshop facilitators such as effective communication skills
Online Learner Self-Assessment	Workshop facilitators have access to (and feel comfortable using) a fairly new computer with up-to-date software, and mobile device	Include activities that require participants to access the Internet or use a mobile device to support their learning
	Workshop facilitators feel comfortable using online tools such as email, chat, discussion boards, social media, and videos	Integrate a variety of technologies to support learning activities
	Workshop facilitators believe administrative and technical support is important for their success	Provide job aids to help answer questions and provide general technical support
	Workshop facilitators are less comfortable having several online conversations taking place at the same, even if they are not participating in all of them	Minimize the number of online conversations at a given time, and keep them focused on the topics at hand
	Workshop facilitators believe that regular contact with an instructor is not that important to their success	Allow workshop facilitators access to an instructor when they need it, rather than through frequent interactions
	Workshop facilitators do not believe that participating in “live” learning events is important to their success	Offer more asynchronous learning activities than synchronous learning activities

***Implementation*.** Arguably, the success of the online professional development hinges on its implementation. In the case of the workshop facilitator network investigated in the present study, it is recommended to implement a multi-step plan that increasingly involves more stakeholders and members of the network. This approach would create increasing excitement around the program as it is developed and implemented. Initially, a small group of subject-matter-experts (experienced workshop facilitators) would work with the national organization to review existing materials that might be used to support an online professional development program. These individuals would also brainstorm ideas and voice concerns from the larger network as they work to design (and develop, when appropriate) components of the program. The resulting prototype would be implemented with a larger group of experienced workshop facilitators, resulting in several smaller iterative review cycles to help improve the program. Finally, the program would be launched to the larger network and continue undergoing minor improvements as appropriate to meet the needs of the network. As indicated by findings in the Online Learner Self-Assessment, a critical component for successful long-term implementation will be the availability of technical and administrative support resources.

Regarding future research. The findings of the present study highlight several opportunities for future research regarding the specific population of workshop facilitators identified here as well as for the larger population of designers-by-assignment.

***Differentiating characteristics*.** Across the (limited) literature on designers-by-assignment, the goal seems to be identifying ways in which designers-by-assignment differ from professional instructional designers. For example, Hooie (2011) and Pickles

(2014) replicated Wedman and Tessmer's (1993) study of professional instructional designers by administering the survey instrument to select populations of designers-by-assignment instead. Pesce's (2012) qualitative study also compared tasks completed by designers-by-assignment to those done generally by professional instructional designers. Perhaps unsurprisingly, findings from this research have indicated than designers-by-assignment and professional instructional designers do very similar tasks and move through a similar set of processes when planning for and facilitating a learning event.

Given these findings, it is recommended that future research instead focus on identifying where designers-by-assignment fall along the spectrum of skill development. In the present study, it was hypothesized that designers-by-assignment behave more like novices than experts. The Design Approach Self-Assessment attempted to identify this delineation by using Gibbons' (2003) four centrisms as indicators of skill development. The next step would be to investigate the validity of the instrument and later retest with another population of designers-by-assignment. Ultimately, the goal of the Design Approach Self-Assessment would be to determine where a designer-by-assignment falls along the continuum of skill development and be used to monitor growth over time. Also, demographic characteristics collected in conjunction with the Design Approach Self-Assessment could be used to identify which experiences (i.e. education level, years of work experience) might already support designers-by-assignment in that role.

On-the-job support. Perhaps the most challenging aspect of studying designers-by-assignment is that in each context designers-by-assignment can vary greatly in what they do (in terms of their primary responsibilities) and the constraints in which they do

instructional design activities (including organizational variables such as resources and desired outcomes). For example, previous research on designers-by-assignment include K-12 teachers (Hooie, 2011), community college faculty (Essmaker, 2012), university faculty (Pickles, 2014), and librarians (Pesce, 2012). Each of these populations (including the one in the present study) were recognized as a group of people who teach others but have had little (if any) formal training in instructional design practices. Although they share this knowledge gap in common, it is likely the learning needs of each group differ based on the knowledge, skills, and abilities required of their context. For this reason, design-based research methodology appears to be a good fit when studying designers-by-assignment and identifying solutions to support their success in this role. For example, future research might consider which tools (and how they are designed) offer sufficient scaffolding for designers-by-assignment or study the degree to which coaching is beneficial (including frequency and types of coaching) as well as identifying characteristics of designers-by-assignment that benefit most from these types of interventions.

Performance evaluation. The literature on instructional design performance focuses on competencies, such as those discussed and consolidated by MacLean and Scott (2011). Although some research has studied which of these competencies are appropriate for designers-by-assignment (Rozitis, 2014; Wills-Espinosa, 2014), there is still a research need to study the performance of designers-by-assignment in terms of these competencies. Future research might use these competencies as dependent measures in an experimental study investigating the impact of professional development,

scaffolding, or another intervention. In a design-based research study, competencies may be appropriate tools for formative and summative evaluation cycles.

***Organizational investment and outcomes*.** Organizations elect to rely on designers-by-assignment for a variety of reasons including cost and convenience. In the example highlighted in the present study, the organization used designers-by-assignment to facilitate workshops largely because of the grassroots nature of its business thus allowing the organization to easily reach its customers all across the country. Regardless, designers-by-assignment require some kind of investment on the part of the organization which likely varies by context depending on whether training is provided, certain people resources are made available, or other resources (i.e. technologies) are needed.

Generally speaking, the goal of the organization is for the designer-by-assignment to create and implement a learning experience that will positively impact its employees or customers and ultimately benefit the organization's bottom line. For example, the organization in the present study planned to invest in a professional development program for its designers-by-assignment in order to improve the quality of workshops and thus expand its customer base and build upon its reputation as a leader in the industry. Alternatively, an organization could pair a designer-by-assignment with an instructional designer or even hire an instructional designer to create the learning experience in place of the designer-by-assignment. Each of these three approaches offers its own set of costs and benefits, and achievement of desired organizational outcomes might look very different. Future research should investigate these three approaches to

designing learning interventions in terms of short- and long-term costs as well as the impact on outcomes such as employee learning and performance.

Conclusion

In summary, the present study investigated the learning needs of workshop facilitators (designers-by-assignment) as the first phase of an extensive designed-based research project for the design and development of a future online professional development program. Three instruments – Design Approach Self-Assessment, Learning Design Skills Questionnaire, and Online Learner Self-Assessment – provided the foundation of the study and collected data that supported the creation of persona profiles representing the four position types reflected in the target population: formal educator, natural resource professional, nonformal educator, and university faculty. An analysis of the results led to recommendations for improving existing processes regarding the network of workshop facilitators as well as suggestions for design of a future online professional development program. Recommendations for future research were also discussed.

Appendix A

ORIA Approval Letter

GEORGE MASON UNIVERSITY

Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-5445; Fax: 703-993-9590

DATE:	April 9, 2015
TO:	Priscilla Norton, PhD
FROM:	George Mason University IRB
Project Title:	[739071-1] Investigating the Design Approach of Designers-by-Assignment: A Learner Analysis of Workshop Facilitators
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	April 9, 2015
REVIEW CATEGORY:	Exemption category #2

Thank you for your submission of New Project materials for this project. The Office of Research Integrity & Assurance (ORIA) has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please note that any revision to previously approved materials must be submitted to the ORIA prior to initiation. Please use the appropriate revision forms for this procedure.

If you have any questions, please contact Bess Dieffenbach at 703-993-5593 or edieffen@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

Appendix B

Design Approach Self-Assessment

How do you currently approach workshops and facilitation?

Directions: Think about when you prepare to facilitate a workshop. What do you do? What do you think about? Review the following statements and indicate how important each statement is to you when you are preparing to facilitate a workshop.

Note: Some of these questions are similar to each other. They are intentionally written with some repetition because this is a new survey instrument. Please respond to each statement as best you can.

5 Extremely important
4 Very important
3 Moderately important
2 Slightly important
1 Not at all important

1. Identifying the best way or approach to deliver the workshop (e.g. duration, in-person or online).
2. Considering a variety of delivery approaches (e.g. duration, in-person or online) for the workshop.
3. Integrating technology (i.e. smart phones, PowerPoint slides) in the workshop.
4. Learning how to use a new technology (i.e. smart phone app like Google Field Trips) and integrating it into the workshop.
5. Being knowledgeable about current and new technologies that can be used to help deliver a workshop.
6. Finding and applying knowledge about current and new technologies to help deliver a workshop.
7. Considering the features and benefits of a variety of delivery approaches (e.g. duration, in-person or online) before selecting one for a workshop.
8. Considering the features and benefits of a technology before using it for a workshop.
9. Selecting a delivery approach (e.g. duration, in-person or online) that I have experience with and feel comfortable with.

10. Assessing and refining my use of current and new technologies to prepare for a workshop.
11. Spending time to create or update materials for a workshop.
12. Applying new, up-to-date approaches (e.g. duration, in-person or online) to deliver a workshop.
13. Determining the best way to get the message, important concepts, or main ideas across during a workshop.
14. Focusing on how I deliver important concepts, main ideas, or other parts of the message during a workshop.
15. Incorporating graphics that illustrate the message, important concepts, or main ideas of the workshop.
16. Including demonstrations that illustrate the message, important concepts, or main ideas during the workshop.
17. Illustrating the workshop's message, important concepts, or main ideas through stories based on my own or others' experiences.
18. Using analogies to illustrate the message, important concepts, or main ideas during the workshop.
19. Identifying ways to gain the participants' attention throughout the workshop.
20. Adding interactive elements to keep participants involved throughout the workshop.
21. Learning from colleagues or other resources about the best way to deliver messages, important concepts, or main ideas effectively during the workshop.
22. Focusing on how to make key message, important concepts, or main ideas "stick" during a workshop.
23. Applying effective facilitation skills to ensure that the message, important concepts, or main ideas are delivered effectively.
24. Identifying ways to focus participants' attention to the message, important concepts, or main ideas throughout the workshop.
25. Using a tried-and-true method to structuring workshops based on my experiences.
26. Incorporating activities that correspond with important concepts during the workshop.
27. Structuring workshops to include activities that emphasize specific topics or concepts.
28. Applying knowledge of how people learn to the structure of workshops.
29. Coming up with new ways to structure workshops to be more effective.
30. Thinking about how people learn and applying that to the workshop's structure.
31. Purposefully structuring content during a workshop so that it is easier for participants to learn.
32. Identifying appropriate instructional strategies for delivering workshops.
33. Identifying appropriate learning activities to use during the workshop.
34. Using a tried-and-true structure when building the workshop agenda.
35. Reusing a successful workshop structure for a future workshop.
36. Reviewing participant evaluations and using feedback to improve the workshop structure.

37. Considering how participants will apply what they have learned after the workshop.
38. Providing participants with time to reflect about how they will use what they learn.
39. Following-up with participants after the workshop.
40. Providing resources and materials to participants for them to use after the workshop.
41. Providing time for participants to reflect and plan how they will apply what they have learned.
42. Supporting participants in applying what they have learned during the workshop to their own context.
43. Incorporating debriefing questions to help participants connect what they have learned during the workshop to their own context.
44. Helping participants connect workshop content to existing knowledge.
45. Incorporating opportunities for me (or a co-facilitator) to provide feedback to participants during the workshop.
46. Incorporating opportunities for me (or a co-facilitator) to coach participants during the workshop.
47. Including activities that help me identify existing knowledge of participants.
48. Sharing additional resources with participants after the workshop.

Appendix C

Learning Design Skills Questionnaire

Which skills would you like to learn?

Directions: For your own professional development as a facilitator, what would you like to learn? Review each statement and identify whether or not you are interested in learning more about the topic.

5 Extremely interested
4 Very interested
3 Moderately interested
2 Slightly interested
1 Not at all interested

Generic Skills

1. Managing a professional development event (i.e. workshop) from start to finish
2. Planning a professional development event or workshop
3. Teaching others in an outdoor setting
4. Leading others
5. Communicating effectively with others
6. Working with others as part of a team
7. Budgeting costs for professional development events and workshops

Learning Design Skills

8. Creating a range of learning experiences (i.e. in-person workshop, webinar) that apply an understanding of how people learn
9. Collecting and analyzing data about the needs of workshop participants
10. Collecting and analyzing data about workshop participants' current knowledge
11. Writing objectives and learning outcomes for a workshop
12. Developing a strategy for the design of a workshop
13. Identifying instructional strategies and learning activities for each learning outcome
14. Selecting from and applying a wide range of learning technologies (i.e. mobile app, PowerPoint slides) to use in a workshop
15. Developing strategies for assessing participants' knowledge
16. Selecting from and applying a variety of assessment techniques

17. Evaluating workshop outcomes
18. Designing and applying quality assurance procedures
19. Hosting and facilitating a workshop
20. Applying knowledge of relevant legislation for accessibility, plagiarism, copyright and intellectual property right issues, security, and confidentiality
21. Applying knowledge of relevant ethical principles and codes of practice
22. Developing my own professional knowledge and skills as a reflective practitioner

Please let us know if there is anything else you would like to learn.

Appendix D

Online Learning Self-Assessment

Are you ready to learn in an online environment?

Directions: Please read each statement indicate the degree to which it describes you.

1 Completely Disagree
2 Somewhat Disagree
3 Neither Disagree or Agree
4 Somewhat Agree
5 Completely Agree

Technology Access

1. I have access to a computer with an Internet connection.
2. I have access to a fairly new computer with satisfactory hardware (e.g. camera, speakers, enough RAM).
3. I have access to a computer with up-to-date versions of common software (e.g. Microsoft Office 2013).
4. I have access to a mobile device with an Internet connection (e.g. smart phone, tablet).

Online Skills and Relationships

5. I have the basic skills to operate a computer (e.g. saving files, creating folders).
6. I have the basic skills to operate a mobile device (e.g. take photo or video, use apps).
7. I have the basic skills for finding my way around the Internet (e.g. using search engines, entering passwords).
8. I can send an email with a file attached.
9. I think that I would be comfortable using a computer and/or mobile device several times a week to participate in professional development.
10. I think that I would be able to communicate effectively with others using online technologies (e.g. email, chat, social media).
11. I think that I would be able to express myself clearly through my writing (e.g. mood, emotions, and humor).
12. I think that I would be able to use online tools (e.g. email, chat, social media) to work on professional development with colleagues who are in different time zones.

13. I think that I would be able to schedule time to provide timely responses to other colleagues.
14. I think that I would be able to ask questions and make comments in clear writing.

Motivation

15. I think that I would be able to remain motivated even though my colleagues are not online at all times.
16. I think that I would be able to work on my professional development even when there are online distractions (e.g. friends sending emails or websites to surf).
17. I think that I would be able to complete my work even when there are distractions in my home (e.g. television, children, and such).

Online Audio/Video

18. I think that I would be able to relate the content of short video clips (1-3 minutes typically) to other information I have learned.
19. I think that I would be able to take notes while watching a video.
20. I think that I would be able to understand information when it's presented in video formats.

Internet Discussions

21. I think that I would be able to carry on a conversation with others using the Internet (e.g. chat, instant messenger, discussion board, social media).
22. I think that I would be comfortable having several discussions taking place in the same online chat or discussion board even though I may not be participating in all of them.
23. I think that I would be able to follow along with an online conversation (e.g. chat, instant messenger, discussion board, social media).
24. I sometimes prefer to have more time to prepare responses to a question.

Importance to Your Success

25. Regular contact with an instructor is important to my success in online professional development.
26. Frequent opportunities to interact with colleagues in "live" events (e.g. conference call, chat room) is important to my success in online professional development.
27. Quick technical and administrative support is important to my success in online professional development.
28. Frequent participation throughout the learning process is important to my success in online professional development.
29. I feel that prior experiences with online technologies (e.g. email, chat, online readings, social media) are important to my success with online professional development.
30. The ability to immediately apply what I learn is important to my success with online professional development.

Comments:

Appendix E

Demographic Questions

Who are you?

Directions: Please read each statement and select the response that best describes you.

1. Please identify your age.
   - 18-34 years
   - 35-50 years
   - 51-69 years
   - 70-86 years
   - 87 years or older

2. Please identify your gender.
   - Male
   - Female

3. Highest degree obtained:
   - Less than high school
   - Completed some high school
   - High school graduate
   - Completed some college
   - Associate degree
   - Bachelor's degree
   - Completed some postgraduate
   - Master's degree
   - Ph.D., law or medical degree
   - Other advanced degree beyond a Master's degree

4. My work position is:
   - Elementary school teacher
   - Middle school teacher
   - High school teacher
   - School administrator
   - Early childhood educator

- Preservice student
- Preservice faculty
- Other college or university faculty
- Homeschool educator
- Nonformal educator (e.g. nature center staff)
- Natural resource professional
- Youth group leader (e.g. Scouts, 4-H)
- Tree Farmer or landowner
- Other (please describe)

5. In which state do you currently live?

6. How would you describe where you live?
   - Urban
   - Rural
   - Suburban

7. How many years have you been involved with this organization? (Type response)

8. How long have you been facilitating workshops?
   - Less than a year
   - 1-3 years
   - 4-6 years
   - 7-9 years
   - 10 years or more

9. How many workshops did you facilitate in the past 12 months?
   - None
   - 1-2 workshops
   - 3-6 workshops
   - 7-12 workshops
   - 13 or more workshops

10. Are you currently a State Coordinator or Facilitator?
    - State Coordinator
    - Facilitator

(If State Coordinator)

11. How many years have you been a State Coordinator? (Type response)

Appendix F

Recruitment Message

Dear Facilitator,

As part of our work to continue to improve our Professional Development (PD) offerings, we are exploring the learning needs of state coordinators and workshop facilitators. The data we collect as part of this work will help National to design and develop an effective PD program for the state coordinators and facilitator network to support the implementation of outcome-based PD approaches. This new Network PD plan is being designed and piloted over the next 12 months, with guidance from a small group of State Coordinators called PD Pathfinders. This work is also being conducted in partial fulfillment of my graduate degree at George Mason University.

This plan will rely on a blended in-person and online approach. To help us focus the design on network needs, I invite you to complete a survey exploring your learning needs and identifying potential pathways and barriers to online learning. This survey has four primary components:

- **Part 1: Are you ready to learn in an online environment?**
- **Part 2: Which skills would you like to learn?**
- **Part 3: How do you currently approach workshops and facilitation?**
- **Part 4: Who are you? (demographic questions)**

Your participation is completely voluntary. There are no risks to participation in this survey, and your responses are confidential. While it is understood that no computer transmission can be perfectly secure, reasonable efforts will be made to protect the confidentiality of your transmission.

The survey will take no more than **30 minutes** to complete. This research has been reviewed according to George Mason University procedures governing your participation in this research.

Please click Next to view the Informed Consent Form and to begin the survey.

If you have any questions or concerns, please contact me.

Thank you for your time and participation.

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Biography

Jennifer N. Pic has several years of experience in designing instruction in both not-for-profit and for-profit contexts. She enjoys exploring and creating learning environments supported by emerging technologies such as mobile, social media, and augmented reality. She earned a B.A. in psychology and an M.S.Ed. in adult education and human resource development from James Madison University. In her doctoral studies, Jennifer's research has focused on the professional development needs of instructional designers and the many roles of teachers in the classroom. At present, Jennifer applies her experience and studies to the development and management of a nation-wide online professional development program for formal and nonformal educators to support the efforts of a national environmental education nonprofit.