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Instructor Beliefs Related to Technology Use After Professional Development

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
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Walden University
2020

Abstract

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MA, Walden University, 2006

BS, Northern Michigan University, 1999

Dissertation Submitted in Partial Fulfillment

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Abstract

Faculty in higher education often see themselves as researchers and identify less as instructors. The problem is that nearly every profession has embraced technology in new ways, except in the world of education and students need 21st-century skills to be competitive in the workforce. The purpose of this qualitative phenomenological study was to explore instructors' lived experiences and beliefs regarding teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. The study was framed by Rogers's diffusion of innovation theory and the sustainability education academic development framework. The research questions investigated how participation in a professional development program changed instructors' beliefs about technology integration to respond to 21st-century learning styles; and the possible change in instructors' lived experiences and beliefs after participation concerning how they taught 21st-century learners. For this study, a series of 3 interviews were conducted with each of 6 university instructors who participated in the professional development program. The data analysis were based on the coding of participant responses and the emerging categories and themes. Key results showed that to promote change in teaching and learning, it is necessary to forge relationships between instructors and with support staff. Recommendations include the development of activities to encourage peer interaction. Implications for positive social change exists in helping designers create trainings that include more interaction between faculty members, promote rich research environments inspiring technology use in teaching and learning, and increasing student success.

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Dedication

I dedicate my work to the many dedicated instructors I have had the privilege to know. It has been your example that has inspired me to want to contribute to the field and to be an agent of change.

I must also dedicate a portion to my daughter, Nora. Thank you for sharing me with my graduate school obligations and research. You inspire me every day not to give up on my dreams.

Acknowledgments

I would like to acknowledge the work of my committee members. Thank you for assisting me in navigating through the process, for being my voice of encouragement, Dr. Hyder and Dr. Mohammed for providing excellent feedback. Dr. Arome, my committee chair, you were invaluable. Thank you.

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Chapter 1: Introduction to the Study

For as long as instructors have been attending professional development, those who design these sessions have struggled to implement lasting change through them. Attending professional development is something that those who want to stay informed do. For institutions to stay innovative and cutting edge, leaders must make a continuous commitment to improve teaching and learning (Nicholls, 2001). Students need 21st-century skills to be competitive in the workforce, yet instructors in kindergarten through Grade 12 (K-12) and higher education are not changing how they teach, even with available professional development opportunities (Ertmer, Ottenbriet-Leftwich, & Tondeur, 2015; Hou & Wilder, 2015; Kopcha, Rieber, & Walker, 2015).

Barriers to technology integration in higher education include restrictive climates, policies, training, and infrastructure issues (Pomeroy, 2014). Trainings have even been cited as factors inhibiting technological change, due to limits on time and technology that may render learning difficult (Pomeroy, 2014). One of the primary predictors of technology use in the classroom has been the beliefs of the instructor related to teaching and learning (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2016). The U.S. Department of Education has funded more than $750 million for projects to create innovative ways for instructors to integrate technology in their teaching (Hsu, 2016). Before technology can be leveraged effectively as a tool for teaching and learning, it is necessary to understand how to enable its use consistently (Ertmer et al., 2015). Best practices and meaningful pedagogy must lead integration (Ertmer et al., 2015). This study was conducted to address a gap in the literature on how beliefs, pedagogy, and

technology use intersect. With this study, I seek to contribute to improved understanding of how professional development is designed, which faculty are targeted by professional development, and when in instructors' careers training may be more effective. More effective professional development may contribute to more effective teaching, leading to student success.

This chapter begins with an overview of the background that frames the study, followed by the problem statement, purpose, and research questions.

Background

Research on the relationship between an instructor's beliefs, instruction, and student learning has increased within the past 20 years (Ashton, 2015). Aldunate and Nussbaum (2013) conducted research that supported the importance of early technology integration among instructors. They found that when there were no early adopters of a technology, it would generally not be adopted, and late adopters were more apt to abandon its use (Aldunate & Nussbaum, 2013). Many instructors use words such as *afraid* and *intimidated* to describe their feelings toward learning new technologies (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

Professional development may assist instructors in getting over their fear of technology and gaining a better understanding of the benefits of using technology in teaching and learning (Deaker, Stein, & Spiller, 2016; Jaipal-jamani, Figg, Gallagher, Scott, & Ciampa, 2015). By supporting adopters of technologies, professional development may empower them to become leaders, inspiring others. Instructors in higher education are usually not required to participate in professional development, but

recently universities have been placing more emphasis on improving the experiences of learners and have been offering more professional development opportunities toward this goal (Deaker et al., 2016).

Instructors in higher education often see themselves as researchers and topic experts and identify less as instructors (Deaker et al., 2016; Nicholls, 2001). There is a well-established system built within universities whereby research is rewarded (Nicholls, 2001; Nygaard, 2017). The research conducted in these settings generally has little to do with teaching; however, teaching is vital for universities and academic departments (Nygaard, 2017). Those who have the job of promoting technology integration need to understand that there is not a one-size-fits-all approach to promoting change in the beliefs of instructors (Ertmer et al., 2015).

Although research has also shown that instructors' beliefs are not always reflected in how they teach, some instructors choose to omit technology in their instruction even when they believe it to have inherent value, and even when it is readily available (Ertmer et al., 2015). Lack of money to support the technology integration process, time constraints, and lack of recognition are factors prohibiting innovative teaching (Smith, 2012). The theory of innovation indicates that even when individuals have knowledge of educational technology, their attitudes or beliefs may inhibit its use (Rogers, 2003; Sahin, 2006).

Instructors' beliefs can influence their desire to change (Ertmer et al., 2015). Beliefs can only be inferred from what people say (Ashton, 2015). However, if an instructor has had a negative experience with technology, even long ago, it may have

become a barrier to the willingness to try technology again, even if the instructor is shown that technology can be an effective tool (Ertmer et al., 2015). How instructors see themselves as teachers is another indicator for predicting their willingness to use technology in their classroom (Herckis, 2018). If, for example, instructors have never seen another instructor in their discipline use technology, they might not identify technology use as a component of good teaching for their discipline. Beliefs related to identity are related to instructors' assumptions about how people learn and why they teach what they teach (Chien, Wu, & Hsu, 2014; Herckis, 2018). An understanding of instructors' beliefs related to the integration of technology is an important to the effort to implement change (Chien et al., 2014). If it is possible to predict who will be most responsive to change and to use this information in selecting whom to target and determining how to target them, it might be possible to make better choices concerning how to promote technology integration. Designers of professional development may also be better at customizing content within professional development opportunities to find those who are receptive and focus more on what promotes change.

In this study, I used phenomenological methodology, an approach that has often been overlooked in research on professional development. Ertmer et al. (2015) explained that it may not be possible to change the beliefs of instructors. It can be just as effective, Ertmer et al. suggested, to help instructors learn new practices involving technology; in time, they may adjust their beliefs through experiences that increase their potential to adopt new technologies. I investigated whether instructors' experiences with professional development activity through a Midwestern Tier 1 research institution's professional

development program influenced and promoted change in how they saw themselves as instructors. Those tasked with inspiring change and technology use in higher education may find insights from this study important, since it has been conducted in an attempt to fill a gap in research which may be provide insight into trying to change an instructor's beliefs related to teaching and learning with technology (Ertmer, 2005).

Professional Development Program

The Midwestern Tier 1 research institution's professional development offerings support student learning through a course redesign program (Redacted, 2016a). The mission of this professional development program is to improve student performance by redesigning foundational courses to support student-centered learning in classes traditionally taught through lectures (Redacted, 2017b). The goal of the program is to create environments for student-centered learning and technologies in large-enrollment foundational courses (Redacted, 2017b).

One of the unique features of the professional development program is the diversity of the courses and departments involved (Redacted, 2017b; Redacted, 2016b). The administrators of the program foster collaborative effort by including staff from libraries, instructional technologists, and course designers (Redacted, 2013a). This partnership allows instructors to draw upon the expertise of others in their course redesign, thus allowing them to consider strategies and resources that they would otherwise not be aware of.

The theoretical framework of the professional development program is based on self-actualization theory (Redacted, 2017b). Self-actualization theory, while undergoing

recent debate in which revisions were proposed to Maslow's pyramid of needs, has been used in the traditional sense in this program, suggesting that people strive to be what they can be (Kenrick, 2017). This theory indicates that as individuals grow and mature, they shift more attention to the needs of others and expand to their full potential as people (D'Souza & Gurin, 2016). Applied to education, self-actualization theory indicates that as individuals mature as instructors, they will gradually look for ways to improve themselves.

In the professional development program, instructors are encouraged but not required to use course redesign as an opportunity for research. Assistance is offered in gathering related data, and staff with research expertise are made available (Redacted, 2017b). As of the end of 2016, 234 unique courses had been redesigned through the professional development program, and 73 instructors had participated in the program (Redacted, 2017b; Redacted, 2016b). The professional development program's webpage mentions that the university uses these instructors and courses to promote change in their respective departments and seeks to help instructors who have participated in the program to become leaders promoting change in teaching and learning (Redacted, 2017b). The instructors who take part in this program represent a diverse group of individuals, encompassing instructors who are already teaching effectively with technology, instructors who think of technology integration as the use of slides during a lecture, and instructors who use no technology in the classroom and actively discourage technology use by students.

I attempted to identify whether instructors' beliefs evolved after they left the professional development program and whether this change influenced their beliefs related to using technology in their classrooms. Long-term, collaborative, inquiry-oriented professional development has been noted as successful in changing beliefs related to practice in the classroom (Ashton, 2015). While studies have focused on various programs, no qualitative study using this method has been published related to the professional development program at the university that was the focus of this study (Coultman, 2015).

Problem Statement

Technology affects nearly every aspect of contemporary life. Nearly every profession has embraced its usefulness in ways unheard of just a few years ago. In 2017 it was estimated that today there would be 50 billion connected devices (Hussain, 2017). Growth related to the field of technology as it pertains to health care, smart vehicles, smart homes, social networking, and the business world is expected to continue the trend (Hussain, 2017). Education, though, has been slow to change (Pomeroy, 2014). Students often find their educational experience to be one of the few places where technology has not been integrated in a meaningful way (Pine-Thomas, 2017). Assisting instructors in changing how they teach and supporting new ways of student learning has been a struggle, especially in higher education (Coultman, 2015; Pine-Thomas, 2017). Meeting the needs of instructors in higher education with professional development that fits their needs and abilities is not an easy task (Deaker et al., 2016). The emphasis on research, especially at research-centric universities, is a primary focus for staff promotion and

institutional ranking (Dickson, Hughes, & Stephens, 2016). However, designers of instruction know that personalized professional development for instructors can improve student learning (Derting et al., 2016).

The problem is getting instructors to use technology in an effective way in their classrooms. At a 2015 symposium for the instructors and staff of a Midwestern Tier 1 research institution, Dr. Mazur, a physics professor at Harvard, contended that it was possible for a teacher, even an experienced one, to be completely misled into thinking that students had been taught effectively (Mazur, 2015). Promoters of educational technology know that technology adoption is not prevalent in higher education (Jaipal-jamani et al., 2015). Student-centered learning has been shown to be more effective than traditional lecture methods, especially when technological tools augment instruction and are used effectively for both students and instructors (Ebert-May et al., 2011). Instructors will also be more inclined to retain those changes even after professional development. Collaborative professional development has been shown to be more productive than the traditional, one-time-offering lecture style (Jaipal-jamani et al., 2015).

Instructors can play a significant role in promoting innovative teaching styles (Hou & Wilder, 2015). If even one instructor begins using technology effectively in students' learning experiences, he or she can help promote adoption across the entire educational system (Bue & Divjak, 2016). According to Yurtseven and Bademcioglu (2016), various aspects of professional development need to be looked at more extensively. Yurtseven and Bademcioglu noted a growing need for research related to professional development. Case studies involving interviews and surveys for data

collection have been used most frequently in the past, but other methodologies need to be considered (Yurtseven & Bademcioglu, 2016). This represents a gap in the literature that I conducted this study to address.

Many instructors are unaware of how student-centered learning or experiential learning can be done in their courses (Hou & Wilder, 2015). Such instructors were probably not taught with technology in the teaching or learning process, and they are unlikely to have experienced their subject matter presented in a way that involved technology. At the same time, instructors often agree these teaching techniques such as using technology are helpful in problem solving and promoting critical thinking in students (Wurdinger & Allison, 2017). Research has shown that the previous experiences of an instructor complete the individual and form the individual's teaching style (Barbarà-i-Molinero, Cascón-Pereira, & Hernández-Lara, 2017).

Purpose of the Study

The purpose of this qualitative phenomenological study was to explore lived experiences and instructor beliefs on teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. The desire was to find common themes across participant experiences and identify whether specific activities promoted technology use. The phenomenon was defined as the Midwestern Tier 1 research institution campus course redesign program.

The results of this study may inform the designers of professional development, so that they can know which activities are most associated with activities recommended as being the most useful in inspiring technology use by instructors. If instructors all

pointed to collaborating with technology-mindful peers as being the most inspiring for them to teach with technology, more of such activities can be recommended for future programs. If nothing is identified as inspiring more integration of technology, it might be recommended to look for different, untried ways to introduce teaching with technology. This study employed a qualitative phenomenological approach with six voluntary instructors who participated in the professional development program. These instructors took part in a series of three interviews each that examined their beliefs before, during, and after participation in the same professional development opportunity.

The professional development program teaches instructors how to use active learning as a tool for instruction (Redacted, 2013b). Instructors receive personalized training specific to the needs of their courses (Redacted, 2013b). The willingness of instructors to participate successfully in the professional development program is influenced by their attitude and impression of the process. Improved understanding of how those who have already been involved in the process think about it may afford insight into how to make the program better as well as more effective (Yurtseven & Bademcioglu, 2016).

The beliefs of instructors are among the key indicators of how they teach and evolve as educators in their teaching as new things are learned (Hoffman & Seidel, 2015). Beliefs can influence behavior by providing a filter for how information is processed and taught to students (Hoffman & Seidel, 2015). A strong relationship has been shown between beliefs and how an instructor teaches (Hoffman & Seidel, 2015).

Research Questions

Primary question: How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners?

Subquestion: How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st-century learners?

Conceptual Framework

Rogers's diffusion of innovation theory and the sustainability education academic development (SAED) framework were used to frame this study. The SAED framework is a new framework that is intended to predict whether conditions exist for change to happen in how an instructor teaches (Holdsworth & Thomas, 2015). It indicates that for change to be possible, an instructor's beliefs and organization must be continually evolving and improving for change to be supported and encouraged (Holdsworth & Thomas, 2015).

In that this study addressed technology integration as it happened through professional development, Rogers's (2003) innovation theory provided a technology integration lens through which to examine the data. The diffusion of innovation theory was used to determine whether early adopters of this professional development program began to initiate a culture of change related to beliefs about technology use across campus. I attempted to determine whether the instructors were already teaching with technology before the program if they taught with technology after, and if they were still

doing so at the time of this study. If they were not, the interview was used to identify what barriers they encountered. Rogers's (2003) theory provides a way to examine these barriers, which Rogers referred to as the *innovation-decision process*. The SAED framework was used to examine whether beliefs change because of professional development activity. The SAED framework helped to address the multifaceted support structure that needed to be in place before the technology could be implemented, such as organizational support and knowledge of pedagogy and curriculum (Holdsworth & Thomas, 2015).

The SAED framework can help in predicting whether conditions exist for change to happen. Diffusion of innovation theory was used to determine whether these early adopters began to initiate a culture of change (Holdsworth & Thomas, 2015; Rogers, 2003). The frameworks fit this study well because they provided a broad lens that I could use to examine most of the hurdles that usually must be overcome before technology adoption happens (Yurtseven & Bademcioglu, 2016). Understanding how those who have already been involved in a process think about may afford insights for making the program better as well as more effective (Yurtseven & Bademcioglu, 2016).

Nature of the Study

This was a qualitative phenomenological study. A series of three interviews was conducted with six instructors at a Midwestern Tier 1 research institution who had undergone course redesign through the university's professional development program, for a total of 18 interviews. The first interview covered their educational experiences before going through the professional development program, the second covered their

experiences during the professional development program, and the third covered their teaching experiences after the professional development program. Allowing for time between interviews supports the validity of the interview by placing what they say in context and by giving participants time to think (Seidman, 2013). This strategy helps the interviewer and the participant to keep their focus on each topic of the series (Seidman, 2013). Each interview helped to inform the next interview, providing for a logical sequence that assisted everyone involved in the phase by helping participants to add things they later thought of to the previous topic when needed and to relate the previous topic to the next interview (Seidman, 2013). Seidman (2013) recommended spacing interviews between 3 days and a week apart. Such a schedule provides time for participants to think about the previous session but not enough time for them to forget about the previous session (Seidman, 2013). Seidman (2013) noted experiencing reasonable results when exceptions occurred such as participants being unavailable. The timing also provided flexibility if a participant was not feeling well or was unable to focus on a specific day (Seidman, 2013). It is of utmost importance to allow time for reflection between topics but not so much time that the thoughts from the previous interview are no longer fresh enough to inform the next interview (Seidman, 2013). In order to make the process repeatable and well documented, Seidman (2013) suggested following the recommended timeline, with alterations only as needed.

These participants agreed to be involved in research related to the professional development program and were regularly surveyed, as were their students. According to Padilla-Diaz (2015), phenomenological researchers need to be able to construct meaning

within their world. Understanding the context of their comments is crucial for proper analysis (Padilla-Díaz, 2015). The three-interview strategy is a good way to understand this context (Seidman, 2013). The first interview is conducted to review the individual's beliefs before the phenomena, the second interview is about the phenomena, and the third interview is about any changes in beliefs and practices due to the phenomena (Seidman, 2013). Other approaches such as case study were considered, but because it was the experience of the professional development program, not just the person's story, that was the focal point of this study, the phenomenological approach was a better fit (Moustakas, 1994). Phenomenology is best used when experience is being investigated as it was experienced by the participants (Creely, 2016). Phenomenology is effective when the object of study is how beliefs were acquired through an experience (Moustakas, 1994).

In selecting instructors to participate in this study, I began with the earliest participants of the course redesign program in 2011, moving up the list to the most recent program participants. Instructors were selected in this manner to involve those in the study who had the most time to integrate what they had learned and had been early innovators helping to create a culture for change. This group of instructors was a random selection of individuals who self-identified as wanting to participate in the program. The management team of the professional development program permitted me to reach out to these instructors to participate in this research on a volunteer basis.

Most of the research conducted by the university has been quantitative. The entire pool of participants has grown to 312 instructors. Only those who had taught the class that they redesigned at least once were eligible to participate in this study. They were

given a survey outlining the criteria before being interviewed. The first five instructors were selected, plus one for the pilot, from those who qualified and volunteered. They each gave three interviews, including the pilot, for a total of 18 interviews. Five candidates plus a pilot candidate were selected because the university recommended the number of interviews as suggested for the time constraints of the project.

According to Seidman (2013), interviewers may get to a point where they are not learning anything new or are experiencing saturation; if this occurs, the process can become laborious. This can detract from the researcher's ability to be a good interviewer. The number of participants could have been adjusted if saturation had been reached. If participants had dropped out of the study, additional candidates from the same list of professional development program participants would have been asked to participate with the same email sent to the original five. This did not happen.

A qualitative phenomenological design was chosen because it provided a flexible lens that allowed for the examination of the experience of the professional development program, as interpreted by instructors. It is a person's perception of their experiences that become their reality (Husserl, 1931; Moustakas, 1994). A phenomenological approach provided an in-depth view of instructors' impressions of their experience after the redesign process and their beliefs related to teaching and learning.

Definitions

21st-century skills: The skills associated with how technology can be used to support analyzing, reasoning, and communicating effectively, primarily as they relate to teaching and learning (Ertmer et al., 2015).

Beliefs: Beliefs serve as a filter for how a person sees the world by guiding their actions (Borg, 2001). They are ideas that a person is committed to, which they may be conscious of having or not in making sense of the world (Borg, 2001). Beliefs define how a teacher instructs students, either with or without technology (Ertmer, Gopalakrishnan, & Ross, 2001).

Pedagogy: The philosophy that defines how teachers teach (Ertmer et al, 2001). Pedagogy is sometimes defined as relating to K-12 contexts, whereas andragogy is related to higher education. Because much literature uses pedagogy unilaterally when referring to both K-12 and higher education, I use the term *pedagogy* when referring to higher education in this dissertation.

Educational technology: Technologies that are used as tools for learning as well as teaching, requiring learning strategies, teaching approaches, and pedagogical philosophies (Baytak & Akbiyik, 2010).

Innovation in teaching and learning: An idea that is perceived as something new in the field of education (Kopcha et al., 2015).

Technology integration: Involves seeing technology use in instruction not as a separate subject, but as part of everyday practice enhancing teaching and learning (Ertmer et al, 2001).

Professional identity: Personal identity related to career performance that promotes self-adequacy and satisfaction (Trede, Macklin, & Bridges, 2012; Zembylas & Chubbuck, 2015). Professional identities involve the beliefs and values with which people define themselves (Barbarà-i-Molinero et al., 2017).

Epistemologies: Where knowledge and beliefs intersect (Lunn, Walker, & Mascadri, 2015).

Assumptions

To a greater extent than in years past, universities are promoting instructors' desire to teach well and encourage the success of students. Instructors who have gone through the professional development program at the Midwestern Tier 1 research institution that was the focus of this study have engaged in course redesign in which student-centered instruction and technology integration are central. I assumed that such instructors had been exposed to new technologies, had these technologies available, and had considered using them in their courses during the redesign process. Further, I assumed that help in implementing technology was available for instructors and that any potential technical issues were addressed by the support team. Moreover, I assumed that the new technologies discussed within the professional development program challenged the way in which instructors thought about teaching and that instructors found them useful in reaching course objectives.

Scope and Delimitations

The scope of this study was a Tier 1 research institute located in the Midwestern United States. This school, which is more than 100 years old, has a science, technology, engineering, and math (STEM) focus, emphasizing engineering and agriculture as well as business, science, health and human services, pharmacy, and education. The university has established graduate programs (Redacted, 2017a).

The instructors in this study were randomly selected as instructors who had participated in the professional development program (Redacted, 2017b). For this phenomenological study, six instructors were interviewed and selected from the total pool of approximately 150 instructors who had completed the program. Instructors who had not completed an entire iteration of the professional development program were excluded from this study. The availability of instructors was a limitation for this qualitative study in that instructors often have busy schedules.

The technology acceptance model was considered for this study, but the debate surrounding how it neglects the innovation model and human and social processes made it clear that it was not the best fit (Legris, Ingham, & Collerette, 2003). The technological pedagogical content knowledge (TPACK) framework was also considered, but it was determined to be too large of a construct and not specific enough for the parameters of this study (Brantley-Dias & Ertmer, 2013). Appropriate models for this study needed to focus on how technology adoption happens and how beliefs concerning the use of technology develop within the instructor.

Other universities whose demographics and emphasis on research are like those of the Midwestern Tier 1 research university in this study may benefit from this study's results if they have professional development opportunity structures like the professional development program examined. Leaders at such institutions might benefit from the results and be able to transfer them to their setting. The most important component ensuring transferability is targeting early adopters (Rogers, 2003).

The results of this study may help shape how professional development is conducted across research-centric universities. Results may also show whether technology training is a motivating factor in instructors' decisions to change how they teach.

Limitations

Potential weaknesses of this study included my biases as the researcher, in that I had spent a career invested in instructors' professional development. This bias was addressed by having the participating instructors describe their experiences in the professional development program, instead of me making assumptions as to what might have occurred. A further limitation of the study was the inability to address all the concerns gathered from instructors. This limitation was addressed by sharing the results of the study with the professional development program management team.

Threats to quality were possible if instructors did not actively participate in the professional development program fully, if the redesign was incomplete, if instructors decided not to teach the redesign, or if instructors were not assigned to teach the redesigned class again. This threat was addressed by asking instructors questions before the study to ensure that only instructors who had taught their redesigned course at least one time took part in the study. Such individuals had to be willing to volunteer for the project. I attempted to address any scheduling limitations by focusing on the transference of what they may have learned into other courses that they have taught since the professional development program.

Significance

University leaders struggle with how to implement effective professional development (Ebert-May et al., 2011). Examining the crucial link between belief and practice is a significant step in learning how to implement change (Ertmer, Paul, Molly, Eva, & Denise, 2014). In this study, taking instructors through their thought process in how they formed their pedagogy helped them to understand how they arrived at where they were as instructors (Seidman, 2013). I sought to guide them through self-reflection and assist them in gaining a better understanding of their influences and thought processes in why they taught the way they did (Seidman, 2013).

If designers of professional development can figure out how to influence how instructors think about teaching, then there is potential to influence how courses are taught. Implications for social change from an effort such as this one may be subtle at first. However, a better understanding of how to help instructors learn and improve continuously while they are teaching is something that everyone who has tried to implement new technology or improve classroom instruction has sought after. The professional development program could make itself better by focusing on activities that instructors' credit for helping them most. Individuals' social identities as instructors are shaped by watching others teach. Gradually, as instructors see more technology being used in teaching and learning, they contribute to a culture of technology users. Helping future instructors see technology used in a meaningful way can help them perceive more educators as those who teach with technology (Ertmer et al., 2015; Zembylas & Chubbuck, 2015).

Summary

Traditionally, leaders of research-centered universities have not considered good classroom practice to contribute to tenure (Deaker et al., 2016). This is beginning to change at some universities, such as the Midwestern Tier 1 research institution that was investigated for this study, which are implementing professional development opportunities designed to assist instructors in redesigning their courses in a student-centered way and introducing technology options. I explored whether the professional development program was instrumental in changing the beliefs and culture of instructors surrounding the courses that they addressed through the program. Because this Midwestern university's professional development program is used as a model by other universities, understanding its influence on changing beliefs and teaching practice could be instrumental in assisting cultural change across institutions.

Rogers's diffusion of innovation theory and the SAED framework were used as the framework for this study. Chapter 2 includes a review of the literature as it relates to researchers, not instructors, change in professional development, beliefs and technology. It also covers the integration and beliefs, linking emotions, beliefs as they relate to technology integration, and beliefs versus practice.

Chapter 2: Literature Review

Introduction

The purpose of this qualitative phenomenological study was to explore instructors' lived experiences and beliefs regarding teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. The desire was to find common themes across participant experiences and identify whether specific activities promoted technology use. The phenomenon was defined as the Midwestern Tier 1 research institution's campus course redesign program. The results of this study may inform the designers of professional development, so that they can know which activities are most associated with activities recommended as being the most useful in inspiring technology use by instructors. Understanding the lived experiences of those who have been involved in the course redesign process and how they think about it could be helpful to those seeking to make the program better as well as more effective (Yurtseven & Bademcioglu, 2016).

The results of this study may inform the designers of professional development, so that they can know which activities are most associated with activities recommended as being the most useful in inspiring technology use by instructor. If instructors all point to collaborating with technology-mindful peers as being the most inspiring experience influencing them to teach with technology, more of such activities can be recommended for future programs. If nothing is identified as inspiring more integration of technology, it might be recommended to look for different, untried ways to introduce teaching with technology. I employed a qualitative phenomenological study with six voluntary

instructors who had participated in the professional development program in a series of three interviews each, in which I examined their beliefs before, during, and after participation in the same professional development opportunity.

In the literature review, I discuss how instructors at research-centric universities have traditionally not been encouraged to teach well and to instead focus on their research. Instructors at such institutions often leave the responsibility to teach their classes to graduate students (Kane, Sandretto, & Heath, 2002). Many think research to be the primary purpose of higher education and necessary for its future (Nygaard, 2017). Within higher education, many make the assumption that the only teaching advice worth listening to comes from peers within the same discipline and disregard research and professional development opportunities related to best practices (Herckis, 2018; Thomas, Chie, Abraham, Jalarajan Raj, & Beh, 2014).

A lack of administrative support and adequate equipment has inhibited technology integration (Ashrafzadeh & Sayadian, 2015; Reid, 2014). Although they may experience problems associated with the implementation of student-centric, technology-enhanced teaching, self-efficacy has driven some instructors to have a personal passion for teaching, developing a small culture of instructors who share ideas, though often without institutional support (Tondeur et al., 2016). Research-centric universities such as the university examined in this study have established professional development programs for instructors to increase student learning and help students be more successful (Redacted, 2017b).

Instructors' pedagogical beliefs remain the strongest indicator of how they will teach (Ertmer et al., 2015). Instructors' self-efficacy can indicate the likelihood that they will use technology in their classroom (Ertmer et al., 2015). Beliefs have been shown to change slowly (Derting et al., 2016). University instructors often have their own perceptions of what "innovation in teaching and learning" means (Kopcha et al., 2015).

This chapter begins with an overview of the study's problem statement, purpose, literature search strategy, and conceptual framework, followed by the literature review.

Literature Search Strategy

The databases searched for this literature review were ProQuest, EBSCOhost, Academic Search Premier, Mendeley online repository, Education Source, ERIC, and Google Scholar. The following keywords were used in the literature search: *technology beliefs in higher education, beliefs and professional development, beliefs in higher education, diffusion of innovation and instructional design, diffusion of innovation and educational technology/professional development, instructor's beliefs and emotions, beliefs and emotions in higher education,* and *Rogers's innovation theory and higher education.* Articles identified as having related content were used. I used the reference sections of recent publications and dissertations to identify additional sources for the review.

Conceptual Framework

The theories incorporated into the framework for this study were Rogers's diffusion of innovation theory and the SAED framework (Holdsworth & Thomas, 2015).

Rogers's Diffusion of Innovation Theory

Rogers's (2003) diffusion of innovation theory addresses the rate at which a new technology is adopted within a group (Singh & Hardaker, 2014). It identifies attitudes and beliefs about technology as an important component of the rate of diffusion or use (Rogers, 2003). Rogers's theory contains four main components: the innovation, communication channels, time, and a social system.

The innovation. The innovation is the new practice that individuals are being asked to adopt; in the context of this study, the innovations of interest were digital tools, hardware, and software (Rogers, 2003). Innovations have different characteristics that determine their rate of adoption, such as their perceived advantage for use and the user's perspective (Rogers, 2003; Singh & Mayer, 2014). If instructors believe that using a digital tool is going to solve a problem that they are having, this will motivate them to consider using the tool more than if they did not perceive an advantage. The compatibility of the tool with what the instructor already knows is an important contributor to the likelihood of use (Herckis, 2018; Rogers, 2003; Yuzhuo, 2017).

Communication channels. This aspect of innovation involves the potential creation of a network of support for using the tool (Rogers, 2003). Communication channels can develop when an experienced user assists a new user, or when a tutorial is engaged in the form of a book, video, or television show (Rogers, 2003). Rogers (2003) used the word *homophily* to describe the degree that two people have beliefs and lives in common, and *heterophily* to describe differences between people. Communication happens best between people who have more in common, or who are homophilous

(Rogers, 2003). Often, though, technology training is provided by those who are heterophilous with their audience, and communication issues can arise that can inhibit the integration of innovation (Rogers, 2003).

Time. Time is significant in diffusion because individuals need time to process new things, especially when change is the desired outcome (Rogers, 2003). Time is measured in the diffusion of innovation as beginning when individuals acquire knowledge of the innovation, are persuaded to feel favorably toward it, and then make a decision to either adopt or reject it (Rogers, 2003). If individuals decide to adopt the innovation, time continues to be measured when the innovation is used and they decide to either reject it after use or continue to use it (Rogers, 2003).

A social system. The social system referred to in an innovation study is the support structure that surrounds the individual using an innovation (Rogers, 2003). Fellow instructors, support staff, and students may all constitute the social system that can promote or impede the integration of innovation (Rogers, 2003).

Sustainability Education Academic Development Framework

The SAED framework is a new concept designed with the intent of predicting whether the conditions are present for change to happen in education (Holdsworth & Thomas, 2015). It includes sustainability education, academic development, and organizational change.

Sustainability education. The need to reflect on how and why an instructor teaches, identified as beliefs or pedagogy, is essential for adapting education with the changing world. The whole person and the institution must constantly reflect on how and

why curricula are taught (Holdsworth & Thomas, 2015). They need to be open to innovation and new methodologies that can help students succeed. Education is transformed when one perspective is different than the common beliefs and a shift in perspective and actions occur (Holdsworth & Thomas, 2015).

For SAED to happen, instructors need to reflect on their instruction and have an awareness of their pedagogy and how it links with their beliefs (Holdsworth & Thomas, 2015).

Academic development. Academic development or change is defined by comparing a perspective with others as it relates to teaching and learning, beliefs, and curriculum knowledge (Holdsworth & Thomas, 2015). Consistent reflection is ideal for continual improvement, with this process beginning with discussion and moving into self-awareness, identifying alternatives, and then building a new action (Holdsworth & Thomas, 2015). Organizations need also to evolve to accommodate and support this change for it to be successful (Holdsworth & Thomas, 2015).

For SAED to happen, individuals need to be continuous learners and be open to change in instruction and participate in professional development (Holdsworth & Thomas, 2015).

Organizational change. Changing an organization can only happen by including instructors in the planning phases of promoting innovative changes in the curricula, structure, and organization of a university (Holdsworth & Thomas, 2015; Yuzhuo, 2017). Understanding the culture that currently exists within a university is important because changing culture can be very difficult (Holdsworth & Thomas, 2015; Yuzhuo, 2017).

Providing support as needed for changes to happen in teaching and learning areas has been a challenge for research-centric universities, in that research is often where more resources are earmarked (Holdsworth & Thomas, 2015; Singh & Hardaker, 2014).

For SAED to occur, organizations must provide the strong leadership that is necessary to support an evolving curriculum, involving all stakeholders in decisions leading to change and being proactive in reducing resistance (Holdsworth & Thomas, 2015; Singh & Hardaker, 2014).

Sustainability educational praxis. The SAED framework indicates that for change to happen, instructors and organizations need to be open to continuous change and improvements by way of constant self-reflection through learning and challenging beliefs (Holdsworth & Thomas, 2015).

For this study, in which I sought to examine whether learning had taken place after professional development as reflected by participants' potentially changed beliefs and integration of technology compared with their beliefs and technology use in teaching and learning before trainings, these frameworks, used together, provided a necessary lens. Rogers's (2003) theory addresses many of the potential unknowns when examining technology use by instructors, such as the support structure needed for integration, communication with successful users after they are done with related professional development, consideration of the social system, and the time needed to get to know and adopt new technology. All these components must be considered before successful adoption can be expected. The SAED framework helps to relate instructors' beliefs and pedagogy to how they teach (Holdsworth & Thomas, 2015). It credits an instructor's

constant reflection for continual improvement, an openness to change, and organizational support as necessary for change (Holdsworth & Thomas, 2015). One could almost say that Rogers's framework covers the "hardware" needed while SAED covers the "software." Knowing about the technology is important, as is having a digital and personal support structure, but unless instructors are willing to undergo continuous reflection on their pedagogy, sustaining technological change will be difficult (Holdsworth & Thomas, 2015). The SAED theory allows an instructor's beliefs to be examined, which was the central focus in this study, in which I asked how participation in a professional development program changes the beliefs of instructors surrounding technology integration. Rogers's framework addresses individuals' openness to using new technology and change, which may indicate how quickly an instructor might respond to the changing learning styles of 21st-century learners.

Literature Review

Many studies related to professional development focus on the K-12 world; few happen in research-centric, STEM-focused universities. In a dissertation, Olmstead (2016) looked at astronomy and physics faculty at a STEM university. Olmstead reviewed several different types of training, such as workshops with lectures, small groups, independent work, a large group with a closed discussion, and large workshops with open discussions. She found that most of the workshops were lecture heavy with no interaction and did little to promote lasting change in practice (Olmstead, 2016). For courses in which a high number of students are enrolled, it can be more challenging to change practices based on learning from professional development.

In another study, Thomas et al. (2014) presented a literature review of peer-reviewed studies related to professional development and used strengths, weaknesses, opportunities, and threats (SWOT) analysis to look for research gaps in the professional development field. The authors found that some disciplines can become too focused on teaching techniques and noted that instructors may assume that the only teaching advice worth listening to comes from peers within the same discipline (Herckis, 2018; Thomas et al., 2014)

Researchers who investigated professional development in STEM in higher education reported that a program designed for postdoctoral scholars, called Faculty Institutes for Reforming Science Teaching IV (FIRST), taught instructors who completed it to be more student centered in their teaching than those who did not complete the program, noting that participants were able to demonstrate student centeredness in their teaching (Derting et al., 2016). They found that beliefs change slowly but have a direct impact on how instructors teach (Derting et al., 2016). They validated their results with external reviewers who came to the same conclusions (Derting et al., 2016). This study helps to show that while research is limited in higher education related to professional development, this area of research is beginning to grow, with findings consistent with existing literature about beliefs and changing practice in the classrooms of higher education. The research also shows that instructors were able to learn and possibly change their beliefs through professional development programs and then change how they taught (Derting et al., 2016).

Yurtseven and Bademcioglu (2016) conducted a content analysis of research related to professional development. They examined 60 studies conducted between 2005 and 2015 and found that most studies investigating professional development used case studies with surveys, and most gathered data from between one and three or more sources (Yurtseven & Bademcioglu, 2016). Most studies in the area used school teachers as their sample pool, and most used descriptive analysis (Yurtseven & Bademcioglu, 2016). The authors of the studies that they examined recommended that more qualitative research be conducted in the area of professional development among a wider population, and most recommended that the field continue to be studied (Yurtseven & Bademcioglu, 2016). This qualitative study contributed to filling the gap in the literature in using a higher education pool, without a survey but with an interview process designed to examine the evolution of beliefs (Seidman, 2013). Among the more controversial issues that Yurtseven and Bademcioglu (2016) found were the ambiguities associated with professional development. They discussed the role that instructors should play in selecting what counts as professional development in their analysis (Yurtseven & Bademcioglu, 2016). They questioned whether more positive results would come from such training if instructors had an active role in selecting professional development opportunities (Yurtseven & Bademcioglu, 2016). They recommended that researchers in future studies look at different aspects of professional development and noted that a deep look at the dimensions of such programs might be useful (Yurtseven & Bademcioglu, 2016). They suggested that fewer case studies be conducted and that a wider range of stakeholders be included (Yurtseven & Bademcioglu, 2016). It is building on these

concepts related to using fewer case studies to allow more depth of inquiry were used in this study.

Researchers, Not Instructors

Instructors in higher education see themselves as researchers, not instructors, some universities are trying to change this. University instructors are not rewarded for teaching and promotion is usually tied to research (Deaker et al., 2016; Hassan, 2013; Jawitz & Perez, 2016; Nygaard, 2017). Research is thought by many to be the primary purpose of higher education and necessary for its future (Nygaard, 2017). Those who focus on teaching risk compromising their careers and reputations in their field (Hassan, 2013). Instructors also often do not have the support or preparation in the art of teaching (Hellmann, Paus, & Jucks, 2014). Instructors in higher education often see themselves as researchers and topic experts and identify less as being teachers (Nicholls, 2001). Universities that focus on research have historically been thought to invest less in teaching students (Jawitz & Perez, 2015). Investing in good teaching is often considered to be an indication of not taking research seriously in many research institutions of higher education (Jawitz & Perez, 2015). A lack of respect for taking time to teach well is a part of the culture (Jawitz & Perez, 2015). When given the choice to teach well or research better, instructors often prefer research and some even consider teaching to be a "big hassle" (Deaker et al., 2016; Van Schalkwyk, Leibowitz, Herman, & Farmer, 2015). Universities generally do not convey how they desire instructors to balance their time (Jawitz & Perez, 2015; Stupnisky, Hall, Daniels, & Mensah, 2017).

Taking time to engage in professional development activities is considered voluntary within the campus culture (Jawitz & Perez, 2015). The lack of attendance for professional development opportunities offered on university campuses has been attributed to the lack of financial gain and the lack of recognition for instruction and effort (Hassan, 2013). Teaching is thought to be something anyone can do and not something worth an additional time investment (Jawitz & Perez, 2015). Research generates income for the university and fulfills institutional and national requirements (Deaker et al., 2016). While higher education claims they care about teaching, their lack of emphasis on its contributions towards tenure and advancement tell a conflicting story. This difficult situation is something instructors must navigate.

Research is a familiar activity for instructors, something they need to be good at to attain advancement and tenured positions at universities. The "publish or perish" attitude is the culture in which instructors are accustomed (Nygaard, 2017). More innovative instructors have discovered a way to combine good teaching with research (Van Schalkwyk et al., 2015). All graduate fields prepare future instructors on how to publish, few outside of education prepare instructors on how to teach. If instructors think that anyone with a Ph.D. can teach, spending additional time learning how to teach is not something they are going to be inclined to do (Deaker et al., 2016). The buy-in for developing classroom instruction is difficult because the assumption is, instructors should be trusted to teach without interference (McKenna & Boughey, 2014). Some research-centric universities are beginning to provide incentives for instructors to spend time reflecting on their teaching and improve student retention. However, many institutions

that now offer teaching guidelines and professional development opportunities were noted to refer to them as suggestions and did not hold instructors to follow them (McKenna & Boughey, 2014). Skill in teaching is not usually discussed when promotions are discussed, it is the number of publications that receives attention which sends conflicting messages around what is valued within the departments (Van Schalkwyk et al., 2015). This low status for teaching excellence in higher education is a barrier to programs that promote teaching development (Hassan, 2013).

Of the five research-centric universities McKenna and Boughey investigated, all had developed policies to assure better teaching and learning but none had changed how instructors valued teaching and learning (2014). This conflicting message is prevalent making instructors feel torn with conflicting messages and limited time (Van Schalkwyk et al., 2015). Instructors are rewarded with tenure and recognition for publishing while being told they need to devote time to become better instructors with little reward-related. Student success in higher education has been linked to quality teaching supported by effective professional development (Van Schalkwyk et al., 2015). Even though linking good instruction with student success is known, higher education has been slow to change.

There is a culture in higher education where research brings rewards, recognition, funding, and tenure for instructors. Research-driven universities have traditionally viewed teaching as an extra responsibility, almost as a distraction from their research, and have not factored in classroom success with tenure (Deaker et al., 2016; Van Schalkwyk et al., 2015). Instructors have limited time and competing agencies for their attention as

they move up the ranks in higher education, spending time learning how to improve their teaching has been viewed as unnecessary for attaining tenure or success in higher education (Van Schalkwyk et al., 2015). This is beginning to change (Deaker et al., 2016). This study helps identify if this trend for change has happened at the selected Midwestern university.

Change and Professional Development

Currently, there are a growing number of research-centric institutions promoting teaching and learning. Some have developed policies and even programs offering incentives to motivate instructors to improve student retention and grades. Even though the ability to teach does not often help instructors receive tenure some have still managed to invest in their abilities to teach by engaging in professional development designed to help them be better instructors (Jawitz & Perez, 2015; Van Schalkwyk et al., 2015). Peer learning in content-specific areas, as well as time off to participate in professional development, were motivating factors in a study involving teachers (Lucilio, 2009). Barriers still exist especially around integrating technology (Brinkerhoff, 2006; Hsu, 2016). The lack of administrative support and adequate equipment have inhibited technology integration (Ashrafzadeh & Sayadian, 2015; Reid, 2014). Early adopters often just replaced current practices with technology and cited the lack of support and training for their remedial use (Ertmer et al., 2015). Nevertheless, instructors commented when they used technology in their teaching students were more engaged, energetic, focused, and interactive in the learning process (Overbaugh & Lu, 2009). But, little support is provided in many institutions (Brinkerhoff, 2006). Conflicting messages were noted by

Jawitz and Perez (2015) in their research around career advancement criteria and the public messages related to teaching and learning. They found the instructors who invested in their professional development in classroom instruction had their agenda which included a personal passion for teaching and learning (Jawitz & Perez, 2015).

McConnell, Parker, Eberhardt, Koehler, and Lundeberg (2013) found creating virtual and face-to-face learning communities an effective method to share ideas, articles, practical solutions, and develop professional friendships as reported by instructor's participants. Initiating changes in practice, however, are more difficult even with established learning communities since barriers such as perception and beliefs influence change most (Reid, 2014). Self-efficacy has driven some instructors to have a personal passion for teaching, developing a small culture of instructors who share ideas but without institutional support (Tondeur et al., 2016).

Change is happening slowly as some innovators are leading the way for others, even in the STEM fields in higher education. Well respected instructors from well-esteemed universities such as Eric Mazur, a physics professor at Harvard University, are making an impression by speaking and writing about how he has started using student-centric strategies in his classes (Mazur, 2015). Research-centric universities such as the university examined have established professional development programs for instructors to increase student learning and help students be more successful (Redacted, 2017b). EDUCAUSE's 2014 study of instructors related to their views about information technology found most instructors were open to the idea of professional development related to technology use in instruction. The online learning environments, digital

analytics, and the desire to be more effective instructors were cited as some of their key reasons (Dahlstrom & Brooks, 2014). EDUCAUSE's 2015 study of the same topic showed even more support for professional development related to technology by noting their technology use as being more "sophisticated". Central support units were noted as being the primary provider of training related to using technology for teaching and learning and received positive feedback from instructors (Dahlstrom, 2015).

Research into what kind of professional development works best is still hard to identify. There is a huge range of programs. Some programs focus on pedagogy, some on practice, and others on content (Kennedy, 2016). Some of the research on professional development suggests it is a process that should be continued throughout an instructor's entire professional life (Yurtseven & Bademcioglu, 2016). Professional development programs are often criticized for focusing too much on processes and too little on theoretical frameworks (Kennedy, 2016). Little time has been spent assessing professional development workshops or investigating how well they engage instructors (Olmstead & Turpen, 2016). The more instructors participate in professional development, the research shows, the more student-centric their orientation becomes (de Vries, Jansen, & van de Grift, 2013). Instructors with more professional development in higher education tend to have more self-efficacy compared with instructors with less training (Derting et al., 2016). Nevertheless, using what they have learned when they have attended professional development, over time, has proven to be more difficult for instructors (Olmstead & Turpen, 2016).

Reflection and collaboration with peers for professional development is a crucial but missing element in traditional higher education (Leigh, 2016; Nicholls, 2001). Programs shown to have more of a lasting benefit are ones that provide for follow-up and collective participation (Kennedy, 2016). Providing an environment where instructors members can collaborate, learn, and reflect with colleagues is an important component in professional development in higher education (Leigh, 2016; Nicholls, 2001). Collaboration has also been noted to be an important component in contributing to a positive work environment and enjoyment in their careers (Stupnisky et al., 2017). Instructors need to understand why they do what they do and how to change how their students think (Nicholls, 2001). Instructors create better learning communities when they participate in one themselves (Borko, 2004). Establishing feedback loops with colleagues where trust is established and regular communication happens is critical in assessing teaching strategies (Borko, 2004). Chichering and Gamson (1991) site an undergraduate education's purpose is to prepare students to understand and deal intelligently with modern life. They credit good practice to include student-instructor contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and diverse talents as necessary in getting this done (Chickering & Gamson, 1991).

Interaction with their peers to review and reflect on what works is an important component as well as an understanding of how learning communities work by participation in one of their own, is a strategy that helps instructors improve teaching. Interacting with their peers has been noted to be an important component in professional development working is supported by the research by Herckis (2018). She found that an

instructor's identity contributes to how they teach and how they see themselves as instructors can be a barrier to change (Herckis, 2018). She noted higher education instructors in her study fit into one of two groups, the fixed-mindset, and the fixed-growth mindset in her research (Herckis, 2018). The fixed-growth mindset instructors were open to new ideas and felt that teaching was a skill that can be improved upon (Herckis, 2018). The fixed-mindset did not believe teaching can be taught but only improved through personal experience and often disregarded the research in the area (Herckis, 2018). Both groups tried to replicate inspirational teaching if it fit in how they identified as instructors showing that collaboration with peers to be one way to potentially inspire change in practice most likely to work for many instructors (Herckis, 2018). Other studies also support the importance of coaching or mentor relationships within departments as being a great way to facilitate change by collaboration with peers (Desimone & Pak, 2017).

Continual examination of professional development programs needs to happen to identify what parts are having the greatest positive impact on student learning (Derting et al., 2016; Olmstead & Turpen, 2016; Roxå & Mårtensson, 2016) Research on professional development programs found that instructors in K12 recognized learning from their peers as a regular part of their day (Yurtseven & Bademcioglu, 2016). This leads to questioning if this can be true in higher education where teaching schedules and research projects would be less likely to coordinate with peers. Olmstead and Turpen (2016) in their study of professional development, suggest that instructors be taught how to reflect and evaluate their teaching by drawing on support from a community of

educators at their universities. This might assist instructors in continuous improvement and provide the support they need to retain new practices.

Roxa and Martensson (2016) suggest universities share the rationale for why such activities happening within professional development are recommended in the program. Being transparent on why some practices have value might help inform instructors as to the personal value in participation (Roxå & Mårtensson, 2016). Instructors then might have the perception of choosing the activity themselves instead of being required which can help them have a more receptive attitude when participating (Roxå & Mårtensson, 2016).

Traditionally, some universities have valued research over teaching creating a culture with less emphasis on investing time on good teaching practice when that time could be spent on research, a criterion often required for tenure (Van Schalkwyk et al., 2015). Despite this, however, some instructors are actively looking to improve student success and have looked to professional development opportunities to invest in their teaching. Integrating technology has been found to increase student motivation and increase student success but fighting the culture of little support for non-research activities has made this change challenging (Ertmer et al., 2015). Personal passions for teaching have begun to change the traditional research-centric university. Changing the culture around teaching in higher education appears to be key in inspiring more instructors to take this leap into learning how to teach well. Professional development is one way many are hoping to initiate a change in culture. Identifying what works within professional development programs was a key component in this study.

Beliefs

Understanding the formation of pedagogy and how it influences an instructor's career is important. It begins with beliefs. What an instructor knows is not always an indicator of how they teach (Garson, Bourassa, & Odgers, 2016; Jamalzadeh & Shahsavar, 2015; Skott, 2015). Beliefs indicate future decisions and are a judgment of truth (Ashton, 2015). Long term student-driven programs are thought to be successful in changing beliefs (Ashton, 2015). Several things can predict if an instructor will act on their beliefs (Ashton, 2015). Their beliefs about knowledge, parents, and student's reactions to teaching practices, the belief culture they live in, and national policies can all predict the balance between beliefs and actions (Ashton, 2015). Short term experiences are not enough to change beliefs (Ashton, 2015). Beliefs and practices influence each other. It is possible to not always consciously recognize an individual's personal beliefs while teaching (Hoffman & Seidel, 2015). An instructor's pedagogical beliefs are the strongest indicator of how they will teach (Ertmer et al., 2015). Their self-efficacy can indicate the likelihood of an instructor to use technology in their classroom (Ertmer et al., 2015).

Beliefs can be held in isolation and independent of how an individual teaches. While beliefs can be changed, it often takes long term experiences, a change in the culture around them, or a change in national policies to influence a person's beliefs. The question remains though if the behavior is not always consistent with beliefs, do beliefs matter?

Scott's (2015) research about beliefs and pedagogy showed beliefs have been viewed as an obstacle to change. Beliefs predict behavior and trying to change or reform education is hindered when beliefs have not changed (Skott, 2015). Beliefs which are different from values, appear resistant to change (Skott, 2015). They are rooted in personal experiences such as how a person was taught, personal lives, and their education program (Skott, 2015). Beliefs have different functions, some guide actions, some filter information, and experiences (Skott, 2015). They influence how instructors design their course materials (Dandy & Bendersky, 2014). They may choose to follow a purchased format, work with instructional designers, use content from another instructor, or try to create something on their own, all based on what they believe is best for their class. Skott (2015) felt focusing more on education reform instead of trying to change beliefs, would be easier. Even though teachers often teach in ways that do not align with their beliefs, this is generally seen when they are changing practices to better align with beliefs, in the transition phase (Buehl & Beck, 2015).

How these beliefs are formed and change throughout a career is important to investigate as well as looking at the influences their colleagues have, their experiences as a student, and their own experiences in front of the classroom all influence beliefs and practices. Beliefs change first and then after a time, begin to influence a change in practice (Buehl & Beck, 2015). Instructors may not consciously recognize their beliefs while teaching (Hoffman & Seidel, 2015). Beliefs are on a continuum where some are subject to rapid and frequent evolution while others are not (Hoffman & Seidel, 2015). Instructors often inaccurately calibrate their own beliefs and tend not to notice their own

biases (Garson et al., 2016). Personal epistemologies also do not always align with how an instructor teaches (Lunn et al., 2015). Experiencing pre-teacher courses especially methodology courses, influences epistemology but it is unclear what part of these courses promotes changes (Lunn et al., 2015).

Developing a professional identity happens through community membership and becoming a part of the culture in which they reside (Barbarà-i-Molinero et al., 2017; Trede et al., 2012). Beliefs reflect the individual like a lens reality is filtered through, while knowledge is related to the community (Donovan, Borda, Hanley, & Landel, 2015; Vygotsky, 1978). Trede et al.'s (2012) research concluded that once a person becomes a professional, they start to accumulate knowledge and skills like their peers. This sets them apart from those not in their field which creates a professional identity linking them to their peers and profession (Barbarà-i-Molinero et al., 2017; Trede et al., 2012). Therefore, being a member of the profession becomes a part of their identity (Trede et al., 2012). Instructors just beginning their careers who are new to a university are then potentially still creating their professional identities and maybe most open to technology use.

For higher education instructors who have not had pre-teacher classes or an opportunity to develop a personal epistemology outside of their personal experiences as a student, the culture created with colleagues might have more of an influence on their professional identity and beliefs. It would also increase the likelihood of instructors teaching the way they were taught if this fits within the culture of similar professionals.

This study attempted to identify what influences created the participant's beliefs and pedagogy in the classroom.

Technology Integration and Beliefs

Beliefs determine how an instructor interprets and responds to the world by providing the filter all people look through (Watt & Richardson, 2015). Many of the beliefs a person has are ones a person may not be aware they have (Watt & Richardson, 2015). Three beliefs have been attributed to be the best predictors of technology use in instructors: pedagogical beliefs, self-efficacy, and a perception of the value of technology use for students (Hsu, 2016). Many hoped changes would happen to beliefs through the gradual technology integration happening organically in education but this has generally not been the case (Ertmer et al., 2015). The thought was that by integrating technology more, it would expose instructors to a different way of teaching and learning which should help the innovation grow (Donovan et al., 2015; Ertmer et al., 2015). However, they failed to consider the time it takes for drastic change to occur as well as the many variables involved with change (Ertmer et al., 2015). Beliefs have been shown to change slowly (Derting et al., 2016). University instructors often have a perception of what "innovation in teaching and learning" mean (Kopcha et al., 2015). For some instructors, simply using PowerPoint counts as "innovative technology use", while others define "innovative technology" as student-centric interaction with content. Without a universal and clear definition of what "innovation in teaching and learning" means, unintended consequences of personal interpretation of the term will happen (Kopcha et al., 2015). Instructors note, in a 2016 study, the lack of confidence as well as the lack of conviction

of the advantages in using technology still stand in the way of wide-spread use (Teo & Zhou). It is increasingly the online or blended instructors, who teach hybrid courses both in-person and face-to-face are becoming more reliant on digital innovations to support teaching and learning (Brown, 2016). Truly blending instruction may involve belief change for instructors. Instructors who are not comfortable using technology may not understand the benefits of the blended format and may try to replicate the face-to-face classroom in the online environment (Brown, 2016).

Newer instructors are usually more open to using technology related to teaching and learning since they often have constructivist views and teach in a more student-centric way compared to traditional styles of those with more experience (Ertmer et al., 2015; Teo & Zhou, 2016). Several studies have shown instructors who are more traditional in their beliefs often use more instructor-centered technologies while more constructivist instructors tend to use more student-centered technologies (Ertmer et al., 2015). Having experienced a technology rich learning as students are attributed to contributing to positive beliefs about how technology can contribute to student learning (Salleh, 2016). Researchers have found several factors to predict teacher's use of technology in teaching such as their personal beliefs about teaching. Instructors with constructivist views were more apt to accept teaching with technology as opposed to those with traditional views (Teo & Zhou, 2016). Also, the longer an instructor teaches, the more traditional their views seem, and less likely they are to teach using technology (Teo & Zhou, 2016). The biggest predictors of technology used by an instructor were noted to be usefulness, high self-efficacy, and student expectations but it is their beliefs

and the culture in which they work that are the key components (Ertmer et al., 2015; Sadaf, Newby, & Ertmer, 2016; Salleh, 2016; Tondeur et al., 2016).

It has been found that beliefs can and do change over time but some beliefs seem resistant to change, especially early beliefs that have been reinforced (Levin, 2015). Learning more about if, how, when, and why changes occur in instructor's beliefs are important for further research (Levin, 2015). Showing instructors what technology integration looks like is one of the best ways to support change (Ertmer et al., 2015). Instructors who see their peers using technology or implementing a change have been widely successful in promoting change (Ertmer et al., 2015). Some have found they could help create a culture of technology integration and innovative attitudes about learning by promoting successful professional development programs (Ebert-May et al., 2015). They were even successful when only a limited number of instructors engaged in a two-year activity (Ebert-May et al., 2015). Learning to develop a collective efficacy could help such success spread through entire departments and even across schools (Tschannen-Moran, Salloum, & Goddard, 2015).

The longer an instructor teaches, the more established their styles become, and if they have not begun to teach with technology as an integrated tool when they begin, the less likely they will believe such tools are necessary for success. Beliefs can change but this takes time and the culture in which an instructor resides can contribute to future success in technology integration. This study explored if beliefs can be changed and technology use increased after the professional development program.

Linking Emotions, Beliefs, and Technology Integration

A conflict between technology using students and technology avoidant instructors has created a frustrating experience for instructors and a lack of stimulation for students (Berger, 2017). Passively learning content by just listening to lecture and recording content is changing as students are visually disengaging, motivating some instructors to try a more active learning platform (Berger, 2017). But, while some instructors have chosen to adapt to using technology in their teaching others have not been as adventurous and some even prohibit its use (Berger, 2017). The lack of technology use in higher education classrooms correlates with lower technology skills by the instructor and their beliefs related to if they believe using technology supports learning (Berger, 2017; Salleh, 2016). Salleh (2016) found an instructor's personal belief related to the use of technology tools related to teaching and learning had more of an influence on their attitude towards use than social norms.

How or if an instructor reacts to a failing student is influenced by their emotions and beliefs (Gill & Hardin, 2015). Some instructors believe that student's abilities are fixed and cannot change while others believe abilities are malleable (Gill & Hardin, 2015; Herckis, 2018). These beliefs translate into hope for the instructor who believes all students can learn while the other instructor's beliefs can lead to apathy when they do not think all students can learn (Gill & Hardin, 2015). It is argued that instructors beliefs, knowledge, and practice are guided by their beliefs (Jamalzadeh & Shahsavar, 2015). Instructors pedagogical beliefs about using technology as a tool for teaching and learning are some of the strongest predictors for use (Ertmer et al., 2015; Tondeur et al., 2016).

Instructors past experiences and emotional attachments are also a strong predictor of use (Jamalzadeh & Shahsavar, 2015; Teo & Zhou, 2016). Instructors with instructor-centric or apathetic beliefs, do not view technology as essential to learning (Tondeur et al., 2016). Prior negative experiences and false beliefs can also influence behavior. A negative belief related to experience can become an irrational belief even when the situation has changed such as the case with technology infrastructure and equipment reliability (Ozer & Akgun, 2015). A bad experience with technology in the classroom can create a difficult obstacle to overcome in getting that instructor to try teaching with technology again. It has been determined that beliefs, context, and personal knowledge drive an instructor's decision on how to teach (Donovan et al., 2015; Jamalzadeh & Shahsavar, 2015). A false perception can cause barriers to success and a negative emotional inference can be projected onto technology use (Ozer & Akgun, 2015).

It is emotions that are credited with making the connection between beliefs and behavior (Guinea & Markus, 2009). Teo and Zhou (2016) said an instructor's attitude was central to success in technology integration. Beliefs are fueled by emotions (Gill & Hardin, 2015). Every time an instructor interacts with a student they have an emotional experience (Rubie-Davies, 2015). Instructors who had experienced success in the past were more open to using the technology again, those who have not experienced success were more resistant (Teo & Zhou, 2016). Beliefs relate to what some individual thinks to be "good" and "bad" and initiating the appropriate emotional response (Zembylas & Chubbuck, 2015). When a belief is formed from an emotional experience it becomes more difficult to change (Zembylas & Chubbuck, 2015). When a belief is formed from an

emotional experience it becomes more difficult to change (Zembylas & Chubbuck, 2015). Negative experiences drive a stronger emotional response even when the situation has changed, the negative emotions and beliefs can predispose an instructor towards failure they may cause themselves (Ozer & Akgun, 2015). Another failed technology experience can cause an irrational belief and prejudice, dominating their beliefs (Ozer & Akgun, 2015).

An instructor's emotional state at the time of technology use can also predict success as well as their willingness to try new things (Darban & Polites, 2016). Negative emotions such as anger have been shown to inhibit an instructor's willingness to learn but emotions such as excitement enhance their willingness to learn (Darban & Polites, 2016).

When an individual's identity is related to that belief, change can be even more difficult (Zembylas & Chubbuck, 2015). An instructor's identity comes from more than the individual. Zembylas and Chubbuck (2015) found it comes from the culture and community of practice. Being mindful of an instructor's emotional state and culture could influence how effective professional development might be. By being sensitive to others emotional well-being can make others more compassionate (Jazaieri et al., 2014). Negative emotions related to professional development are not uncommon (Christesen & Turner, 2014). If an instructor has a negative attitude about a training session, they are less likely to implement or change anything presented (Christesen & Turner, 2014).

Instructors need to be involved in the learning process and see changes as relevant before they will consider altering how they teach (Christesen & Turner, 2014). If they do decide to implement a change such as a new technology, instructors who saw an increase

in student learning because of the implementation experienced more self-efficacy and positive emotions (Christesen & Turner, 2014). Instructors having more self-efficacy has been related to more innovative teaching, more technology use, and enhanced student motivation (Ertmer et al., 2015; Watt & Richardson, 2015). Self-determination has been linked to self-efficacy (Watt & Richardson, 2015). For an instructor to have self-efficacy they need to feel valued, have the coping strategies to deal with their profession, and have cultural support in teaching in a student-centric way (Watt & Richardson, 2015). Individuals avoid situations they believe are beyond their abilities and gravitate towards environments where they are likely to succeed (Siwatu & Chesnut, 2015). When instructors unsuccessfully try something new and it fails they often begin to have self-efficacy doubts especially when they are new or are trying something for the first time (Siwatu & Chesnut, 2015).

The collision of emotions and beliefs may be an indicator of why technology integration can be a challenge for many instructors. If an instructor has ever had a negative experience with technology, with technical support, infrastructure, or with a tool not working as it should, this could cause negative emotions, triggering negative beliefs, creating prejudice, and discourage use. Over-coming such experiences will take time and will need to be countered with positive experiences. An instructor's identity, as well as the identity of the department, can also predict success with a change in practice and success in technology implementation. If a department is one whose culture dictates one way of acceptable teaching, it will be harder for an instructor to be different and still fit in as a colleague. This study attempted to understand if negative experiences with

technology and their professional culture have influenced them and how this has influenced their beliefs about teaching.

Beliefs Versus Practice

Instructors need to believe they are responsible for student learning before they will find the need to change practices to match beliefs (Buehl & Beck, 2015). If beliefs are not considered, change in practice will be obstructed (Fives, Lacatena, & Gerard, 2015). The research is showing that when an instructor's practice does not align with belief, their beliefs may be in flux (Buehl & Beck, 2015). Their practices may not yet have had time to reflect their change in beliefs (Buehl & Beck, 2015). Change in behavior is a process and it takes time to occur (Hou & Wilder, 2015). This would account for the broad range of differences shown in the literature indicating the different stages of flux. If this is true, a great time to investigate how beliefs change is after participating in professional development opportunities, especially in longitudinal studies that may be able to show this change over time (Buehl & Beck, 2015).

Instructors can also be resistant to change (Fives et al., 2015). Researchers need to remember that changes in practice can be temporary and lasting changes in practice occur slowly (Derting et al., 2016; Levin, 2015). The more self-efficacy an instructor has usually meant they have experienced more training related to teaching and are more open to change (Derting et al., 2016). Having high self-efficacy means an instructor is better at meeting the needs of their students, they prepare more for class and adjust their expectations to meet their students (Rubie-Davies, 2015). Professional development needs to include experiences that allow instructors to observe, reflect, exhibit self-

efficacy and experience new things that support why change is needed (Fives et al., 2015) Taking the time to reflect on their beliefs, values, and expectations related to how they should teach is a valuable component in initiating a teaching philosophy, something instructors outside of the education field seldom learn to do (Yeom, Miller, & Delp, 2018). This should allow instructors time to think about the university's vision and mission and how that aligns with their department and then with their classroom instruction (Yeom et al., 2018).

Faulkner (2015) found that the technology choices instructors generally make are related to their comfort level with the technologies. His study found significant differences between age and gender. Also, there was not one single variable that predicted technology use but a multitude of factors (Faulkner, 2015). He concluded that instructors beliefs and technology preferences should be considered when professional development opportunities are planned (Faulkner, 2015). Perhaps a good way to begin might be to find out what technology they are currently using and see if they could adapt a tool for teaching and learning that they already know.

Barriers to change can discourage instructors to try to change. Issues such as administrative structure, technical expertise, student support, access, and evaluations of effectiveness have been noted to be barriers for technology integration (Reid, 2014). Not having a tenure track appointment or the recognition tenured faculty are more likely to receive is another barrier that can lead to uncommitted instructors and a diminished campus climate (Ott & Cisneros, 2015). Trainers need to realize instructors can have multiple beliefs at the same time, inhibiting change (Fives et al., 2015). If an instructor

does not believe they can implement change, or if they believe they do not have the support, they will resist (Fives et al., 2015). The climate within a department can dictate if a change is likely as well as university politics (Barnes, Fives, & Dacey, 2015). Instructors who have participated in learning communities with instructors who teach in similar subjects have indicated they were extremely helpful in planning and sharing resources for even large enrollment courses (Elliott et al., 2016). Trying to overcome the challenges alone can be a barrier to success. Support for such programs is vital to their success by departments and instructors (Elliott et al., 2016).

Higher education instructors who teach at research-centric institutions face pressure to produce research (Deaker et al., 2016). Traditions within fields often create the culture in higher education departments and this can be a deterrent for trying something new (Deaker et al., 2016). Traditionally, having a Ph.D. is considered enough evidence of competency in teaching in many fields (Deaker et al., 2016). It is not uncommon for instructors to blame students for not being prepared instead of examining their teaching (Deaker et al., 2016). When research is rewarded and teaching is not, instructors are often not interested in participating in professional development focusing on teaching (Deaker et al., 2016).

The emotional link to beliefs is also a barrier that must be considered. If using technology correlates to a negative response, professional development opportunities related to technology may be met with resistance. Professional development designers need to consider former negative experiences related to technology use. There may be multiple negative issues inhibiting use such as the lack of support or even the perceived

lack of support or the idea of using technology as a tool in the classroom makes little difference in student success. Interviewing instructors about their time before, during, and after their professional development at the selected university, may give an emotional insight into how they felt about the program which could shed insight in their likelihood to integrate anything learned into their classroom. Researchers have found that professional development does not always work to change anything related to classroom instruction (Herckis, 2018). The importance of an instructor's culture, beliefs, and their own experiences in the classroom can all influence their openness to teach with technology (Derting et al., 2016; Thomas et al., 2014). While some programs have shown some success over time, figuring out what works may help to inform future training (Derting et al., 2016). Debate surrounds discussions related to how much autonomy instructors should have when selecting professional development and if teaching skills should contribute towards tenure (Yurtseven & Bademcioglu, 2016). Yurtseven and Bademcioglu (2016) recommended future studies look at different aspects of professional development so that a deep look at the dimensions of such programs might be useful. This study attempted to contribute to this gap.

Summary and Conclusions

Instructors come into the world of higher education generally with a strong understanding of how research is conducted and published. Universities that emphasize research value publication for promotion and tenure. More of an emphasis is being placed on student success in higher education and instructors expect student success in the class. Instructors generally are not taught how to teach (Nicholls, 2001). Traditionally, this

emphasis was considered not important but this is beginning to change. With the introduction of technology into the world of teaching and learning, instructors are finding that they need more professional development. Change agents in higher education have found that to change practice an instructor's beliefs need to be acknowledged. Beliefs do not always correlate with how an instructor teaches (Tondeur et al., 2016). This change in how an instructor teaches has been shown to take time. Barriers to technology integration can stem from a lack of support to a history of unsuccessful attempts at using technology in the classroom. Those who provide professional development for instructors need to know which specific activities lead to results. Currently, some things seem to work and other things do not. Some instructors are open, while others are not (Herckis, 2018). Most studies in the area used school teachers as their sample pool and most used a descriptive analysis type (Yurtseven & Bademcioglu, 2016). The studies examined recommended more qualitative research be conducted in the area of professional development among a wider population and most of the studies recommended the field continued to be studied (Yurtseven & Bademcioglu, 2016). This qualitative study contributes to filling the gap since it proposes using a higher education pool, without a survey but with an interview process that is designed to examine the evolution of beliefs (Seidman, 2013).Working to provide the best opportunities and promote a positive culture surrounding technology use in the classroom is what this study contributes to the body of literature in addressing this gap.

Chapter 3 will present the research design and rationale of the study, the methodology used, procedures for data collection, and a data analysis plan.

Chapter 3: Research Method

Introduction

The purpose of this qualitative phenomenological study was to explore instructors' lived experiences and beliefs on teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. The results of this study may inform the designers of professional development, so that they can know which activities are most associated with activities recommended as being the most useful in inspiring technology use by instructors. If instructors all point to collaborating with technology-mindful peers as being the most inspiring for them to teach with technology, more of such activities can be recommended for future programs. If nothing is identified as inspiring more integration of technology, it might be recommended to look for different, untried ways to introduce teaching with technology. I employed a qualitative phenomenological study with six voluntary instructors who had participated in a specific professional development program. Study participants took part in a series of three interviews each that examined their beliefs before, during, and after participation in the same professional development opportunity.

In this chapter, I begin with an overview of the research design and rationale and proceed to descriptions of the phenomenological tradition, my role as the researcher, methodology and size, procedures for data collection, data analysis, trustworthiness, credibility, dependability, and ethical procedures.

Research Design and Rationale

Primary question: How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners?

Subquestion: How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st-century learners?

This was a phenomenological study using a series of three interviews conducted with six instructors at a Midwestern university who had undergone course redesign through the professional development program, totaling 18 interviews. The first interview covered participants' educational experiences before going through the professional development program, the second covered their experiences during the professional development program, and the third covered their teaching experiences after a professional development program. These instructors agreed to be involved in research related to a professional development program and were regularly surveyed along with their students.

According to Padilla-Diaz (2015), phenomenological researchers need to be able to construct meaning within their world. Understanding the context of their comments is crucial for proper analysis (Padilla-Díaz, 2015). Using the three-interview strategy is a good way to understand this context (Seidman, 2013). The first interview involves reviewing beliefs before the phenomena, the second is about the phenomena, and the

third is about any changes in beliefs and practices due to the phenomena (Seidman, 2013).

Other approaches such as case study were considered, but because it was individuals' experience of the professional development program, not just their stories, that was the focal point of this study, the phenomenological approach was a better fit (Moustakas, 1994). Phenomenology is best used when an experience is being investigated as it was experienced by the participants (Creely, 2016). Phenomenology is effective for studying how beliefs are acquired through experience (Moustakas, 1994). The desire is to find themes within participants' experiences and identify whether specific activities promote technology use or contribute to belief change.

In selecting instructors to participate in this study, I sought the earliest participants in the professional development program first, starting with those who took part in 2011 and moving up the list to the most recent participants. Instructors were selected in this manner so that they would have had the most time to integrate what they had learned. Additionally, I sought early innovators who had helped to create a culture for change. This group of instructors was a random selection who self-identified as wanting to participate in the study. The management team of the professional development program permitted me to reach out to these instructors to participate in this study on a volunteer basis. Most of the research conducted by the university on the professional development program has been mostly quantitative with digital surveys; there have been fewer qualitative research projects completed to date. The entire pool of participants had grown to 312 instructors at the time of this study. Only those who had

taught the class that they redesigned at least once were eligible to participate. They were given a survey outlining the criteria for inclusion in the study before being interviewed.

This study may help in identifying which activities influence beliefs, which may assist in the design of more effective professional development programs that ultimately increase the use of technology in teaching and learning. This study may address a gap in initiating change in the classroom. Short-term experiences are generally used to motivate change (Ashton, 2015). The history of research into belief change has shown that making change happen is a long and complex task (Ashton, 2015).

While qualitative research is the most common in investigations of professional development, interviews and surveys are the most common tools for data collection (Yurtseven & Bademcioglu, 2016). Of the 60 studies that Yurtseven and Bademcioglu (2016) reviewed, none used the three-survey approach that allows for phenomena to be isolated (Seidman, 2013). A quantitative approach was rejected because I sought to discover the essence of the experience undergone by the instructors. Simply quantifying already-prepared survey questions does not allow an investigation to be driven by the story of the experience. This made qualitative inquiry the best vehicle to examine this phenomenon.

Phenomenological Tradition

The qualitative tradition that was best suited to this study of belief change in instructors involved comparing interviews in a phenomenological study. The phenomenological method was appropriate for this study because each person's narrative and feelings provided insight into the related phenomenon, and phenomenological

research made this possible (Yuksel & Yildirim, 2015). Phenomenology is best used when experiences are being investigated as they were experienced by the participants (Creely, 2016). Phenomenology is effective for a study of how beliefs are acquired through an experience (Moustakas, 1994).

According to Moustakas (1994), when Husserl first proposed phenomenology as a qualitative methodology, he claimed that it involved the examination of what was perceived as a blending of perception with reality. Investigating perception frees researchers from assumptions (Husserl, 1931). It is the essence of the shared experience that phenomenology is designed to find (Merriam, 1998). It is the blending of what is real with what is perceived (Moustakas, 1994). A true understanding of experience is what researchers conducting phenomenological inquiry strive to attain (Moustakas, 1994). This is done by allowing the phenomena to speak through the interpretations of participants and allowing them to create their structure of the event (Moustakas, 1994). When conducting phenomenological research, researchers need to understand and block any biases or prejudices they may have and continually refer to the essence of the experience instead of their thoughts about the experience or the interviews (Merriam & Tisdell, 2015). Researchers can use imaginative variation, or the ability to view the phenomena from the perspective of those being interviewed (Merriam & Tisdell, 2015).

I attempted to reflect the traditions of phenomenological inquiry by asking those interviewed to delve deeper into their feelings and beliefs related to why they taught the way they did and what their influences had been.

Role of the Researcher

At the time that this study was conducted, I had been employed at the Midwestern university for 5 years. I briefly had a support role within the professional development program when first employed by the university, but I had not been part of the group for more than 2 years. I had built a level of trust among instructors in my role with the university as a course designer, technology support person, and member of the innovative tools in teaching and learning team. I was never employed through the funding of the professional development program in any way. The professional development supervisory boards reported through the provost's office, whereas my employment reported through the chief information officer. As an outsider to the program who had been on the inside, I had supported instructors as they worked through their course design and attended professional development sessions. Thus, I had the perspective of an observer in a job that provided access to instructors from the professional development program.

Because the participants in this study were from the earliest years of the professional development program, the participating instructors were those who had the most time to process what they had learned. This selection strategy also created a pool of instructors who had gone through the professional development program before I became an employee at the university. I may have worked with some members of the pool through other areas of support due to being a current employment at the university, but participation in this study was voluntary. No participants had been or were currently in an instructor or supervisory position with me.

My bias was limited due to employment at the university. Individuals involved in all areas of the professional development program had been extremely supportive of the study. To help prevent bias, all data used in this study were gathered within the limitations of the study. My role was to serve as an instrument for data collection.

Methodology

Using a qualitative phenomenological approach allowed me to select six self-volunteered university instructors who had undergone the professional development program. They were asked through email if they would be willing to participate because this was the typical mode of contact already established by the professional development program for research inquiries. Using the phenomenological approach, this typical sampling employed the use of interviews to measure technology acceptance and potential change in beliefs by instructors.

According to Seidman (2013), interviewers may get to a point where they are not learning anything new, and the process can become laborious. This can detract from the researcher's ability to be a good interviewer. Purposeful rather than random sampling was needed because participation in the professional development program was necessary, and selecting from an already generated list with a clear participation logic established helped to maximize variation (Seidman, 2013).

Questions may be added to interviews to better establish themes. The themes of this inquiry included beliefs and pedagogy related to teaching and learning, technology use, as well as new and emerging themes brought out through the process. I kept a field journal to keep track of thoughts during the interview.

Participant Selection Logic

I used the following process to select instructors for this study:

- Five volunteers plus a pilot were interviewed three times, providing a total of 18 interviews. The number five was proposed because smaller samples allow researchers to dive more deeply into the data and investigate with more attention to detail than a larger sample would (Yurtseven & Bademcioglu, 2016). The number of participants might have needed to be adjusted if saturation had been reached. The change was not needed.
- The primary criterion to be a candidate in this study was participation in the professional development program at the university. In selecting participants, I began with candidates who took part in the professional development program beginning in 2011, working forward in time until I had selected five individuals who fit the criteria, plus a pilot participant. Such instructors are listed on the professional development program webpage (Redacted, 2017b). I began at the bottom of the list. This was used as the participant pool and to target those who entered the program first.
- Instructors needed to be currently employed at the university.
- Instructors needed to still have an instructor role but did not have to be teaching the exact class that had been redesigned.
- Instructors needed to have taught the redesigned class at least one time after having completed the redesign process through the professional development program.

- Instructors needed to have volunteered to participate by using an email response before the provided deadline date.
- All participating instructors needed to have agreed to be interviewed 3 times for approximately 30 minutes, with a maximum 45-minute limit for each session. This provided a total of 15 interviews plus a pilot. All participants were debriefed after the interview to remind them of their ability to retract, review, and withdraw from the study. They were reminded that they might be asked follow-up questions for clarification during the analysis of the data.
- Instructors all agreed to be interviewed online using WebEx and to be audio recorded.
- If any participant had dropped out of the study, additional candidates from the same list of professional development program participants could have been asked to participate using the same email sent to the original five. This was not needed.

Instrumentation

The data collection method involved interviews with WebEx. WebEx is a university-supported tool that records audio through the internet, which creates an artifact of the interview that is available for transcription and analysis. I used a blank paper notebook as a field notebook to write thoughts and follow-up questions during the interviews. The themes of inquiry were beliefs and pedagogy related to teaching and technology use. Strategies such as not interrupting and listening carefully to what was

said, according to Seidman (2016), are the most effective ways to gather the essence of the experience of those being interviewed.

The paper notebook was used to document the validity of the research results, in that I recorded my thought process there. An open-ended, in-depth inquiry was the format, with potential questions added to better establish the theme (Seidman, 2013). Using a three-interview strategy helped to ensure credibility (Oko, 1992). This helped to ensure that comments made during the interviews were in proper context, and it assisted in providing consistency in what participants were saying (Oko, 1992).

Table 1

Interview Questions Related to Research Questions

Research questions	Interview questions
Primary question: How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners?	*Interview 1*: What events shaped your beliefs related to teaching and using technology in the classroom before you were a part of the professional development program? *Interview 2*: What events during the professional development program both validated and challenged your beliefs related to teaching and using technology? *Interview 3*: Given what you have said about your beliefs before you were in the professional development program and what you have said about your beliefs during the professional development program, what are your beliefs related to teaching and using technology today?
Subquestion: How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st-century learners?	*Interview 1*: What events shaped your beliefs related to teaching and learning in the classroom before you were a part of the professional development program? *Interview 2*: What events during the professional development program both validated and challenged your beliefs related to teaching and learning? *Interview 3:* Given what you have said about your beliefs before you were in the professional development program and what you have said about your beliefs during the professional development program, what are your beliefs related to teaching and learning today?

Procedures for Pilot Study

Since I developed the interview instrument, a pilot study was needed (Seidman, 2013). A random volunteer participant from the participants of the professional development program's project was selected to test the instructions, procedures, technology, and allotted time for the interviews. Having a pilot study can alert the researcher of potential issues within how they ask questions that may detract from the objectives and assist in helping them reflect on their approach (Seidman, 2013). A pilot can also help to determine if their approach is appropriate for the study (Seidman, 2013). This pilot helped ensure questions asked brought the desired topics answered. A similar email the participants received, was emailed to potential pilot participants briefly describing the study and outlining what was required of them. Since only minor changes resulted from the pilot, the data from the pilot was included in the results making for a total of six participants.

Procedures for Recruitment, Participation, and Data Collection

I emailed instructors who had gone through the professional development program at the university beginning in 2011 and worked forward in time until five fit the criteria and volunteered. Such instructors are listed on the professional development program's web page (Redacted, 2017b). This email briefly described the study and outlined what was required for participation and what participation required of them. Participants signed a consent form before participating in the study which contributed to informed consent before proceeding (Oko, 1992). Since the interviews were conducted online, I emailed consent forms to prospective participants. Participants were asked to

print the form, sign it, and upload a picture of the signed form and email it back within one week of receipt. The interview, using me as the primary data collection instrument is an effective tool for gathering information from individuals. The interviewer can be adaptable and flexible and fit the interview to meet the needs of the person being interviewed (Seidman, 2013). They can ask follow-up questions that were unanticipated and discover areas rich with relative information (Seidman, 2013).

Creating an outline of the topics to be covered during the interviews contributed to the dependability of the study as well as a transparent audit trail of all methods used. Field notes were recorded and evaluated (Moustakas, 1994). A field notebook was composed so the interviewer could keep track of their thoughts and questions that came to mind during the conversations. These notes helped to inform follow-up questions and show the thinking process of the interviewer. The reflective analysis was used to ensure confirmability in the study.

All recognized potential bias of the researcher was reviewed and described. My job title and background were shared with participants as well as an organizational chart showing how I or the study's results cannot influence tenure or an instructor's job or professional life. Making it clear no power inequity was involved in the study motivated participants to freely sign the consent form and be more willing to volunteer in the study (Oko, 1992). The researcher's involvement in four of the professional development program groups was disclosed, the years they were involved (2014-2015), and any working history within their current job between the participant and me was disclosed if any existed.

Candidates were selected based on their participation in the professional development program at the university beginning in 2011 and working forward in time until five fit the criteria and volunteered. Such instructors are listed on the professional development program's web page (Redacted, 2017b). I began at the bottom of the list, emailing instructors until five volunteers who fit the criteria. This list of the professional development program's participants was used as the pool and target those who entered the program first (Redacted, 2017b). I collected the data using WebEx, an online recording system. If too few participants had volunteered to participate, I would have continued through the list of more than 100 candidates until five were found.

Instructors must have all agreed to be interviewed 3 times for approximately 30 minutes with a maximum 45 minutes limit, each session. Each session should be "no more than one week apart and no less than a day" (Seidman, 2013, p. 53). This provided a total of 15 interviews plus the pilot. One guide question was planned for having consistency and direction in the interviews. Only follow-up questions were asked based on what was said during the interview if the interviewer had them. Otherwise, the purpose of this kind of interview was to primarily listen and keep the topic on the main idea (Seidman, 2013).

They were each debriefed after the interview to remind them of their ability to retract, review, and withdraw from the study. They were reminded they may be asked follow-up questions for clarification during the analysis of the data. After the final interview, participants were promised a copy of the study upon its completion and approval. They could have asked for copies of their transcripts for their review.

Participants were notified during their exit that no identifying information will be used in the study. All such identifying information if mentioned including their name was changed to non-descript substitutions.

Data Analysis Plan

After each recorded interview the data were transcribed and coded using the software tool, NVivo which was used to code and investigate themes discussed in the interviews. NVivo is a well-established coding tool for qualitative research used for coding the transcribed videos based on Saldana's (2016) strategy. Identifying concepts and patterns within topics were coded and related sub nodes were identified using NVivo (Saldana, 2016). Special attention was given to changes in belief and technology use that occurred before and after the instructors participated in the professional development program. The audio files were only available to the researcher and the participants to their related content. All data is securely maintained for 5 years after collection.

Transcripts were read to allow for themes to become apparent. The data was coded using the theming strategy and each research question was a primary node with sub-nodes for related themes shared during the interviews. For example, one code, used in a macro way that relates to the first research question in the study could be "technology use change" and another code, used in a micro way that related to the second research question, could be "belief change" (Saldana, 2016).

Theming the data is a strategy used in phenomenological research that clusters similar thoughts and ideas together (Saldana, 2016). Pointing out significant statements within the data and organizing it, a researcher can better capture the phenomena (Saldana,

2016). While some of the coding's were structured that relate to the research questions, themes that may become apparent during the analysis were coded. Discrepant data was noted and coded as such since an unforeseen pattern of such data was informative during analysis and could be clarified for correct understanding by a follow-up question.

Issues of Trustworthiness

Issues of trustworthiness for qualitative research is important because the qualitative researcher aims to increase understanding of a phenomenon, going through the same professional development program. Being able to trust the results is an important aspect of having credible results (Merriam, 1998). Being able to prove credibility, confirmability, dependability, and transferability are important components in gaining results that are trusted. Qualitative researchers need to be mindful of conducting ethical research (Merriam & Tisdell, 2015).

Credibility

Using a three-interview strategy helped to ensure credibility (Oko, 1992). This helped the comments made during the interview to be in proper context and assisted in providing consistency in what they were saying (Oko, 1992). Comments made in the first interview, for example, aligned with the thought processes described in the latter two interviews. The passage of time while showing consistent thoughts helps to ensure validity (Oko, 1992). This interviewing strategy addressed how the participants made meaning of their experiences over 1-3 weeks. Having more than one participant allowed the researcher to check the comments against the others which can provide multiple perspectives of the same phenomena (Oko, 1992). Being transparent with participants in

allowing them to view notes and transcripts, contribute the credibility (Merriam & Tisdell, 2015). This helps ensure what is said is not interpreted incorrectly which could be a threat to validity (Merriam & Tisdell, 2015). The validity of the study happens when participants can make sense of their experiences to themselves while going through the process of the interviews (Oko, 1992). Phenomenology is about describing experiences without analysis of the experience by the researcher (Moustakas, 1994).

The creation of the pilot helped to establish credibility by testing the validity and helping to ensure the responses were what was expected (Seidman, 2013). Validity was also addressed by using the three-interview structure since it placed comments in context and it allowed for participants, during the time between interviews, to check the consistency of what they said (Seidman, 2013). If the structure of the interview allowed instructors to make sense to themselves and the researcher, it has contributed towards validity (Seidman, 2013).

Transferability

Participant selection was voluntary from the participant list of instructors who had already participated in the professional development program at the university. The participants in the professional development program were a collection of instructors who willingly decided to participate in the program as well as instructors whose departments asked them to participate. Participants were from most disciplines and schools across the university's campus (Redacted, 2016b). Other universities with a similar demographic and emphasis on research as the Midwestern Tier 1 research university in the study have professional development opportunities structures like the professional development

program could benefit from the results and be able to transfer the results to their setting. The most important component ensuring transferability is targeting the early adopters (Rogers, 2003). Early adopters who volunteered to be a part of the professional development program first exhibited the qualities Rogers (2003) referred to, a willingness to change. As the professional development program progressed over several years, eventually many more participants attended because they were required by their departments (Redacted, 2016b). Since these instructors would not be considered early adopters, they might not exhibit the same willingness to change.

Dependability

Understanding the random sample generated by the professional development program's team's list of participants helped inform the external validity of the study. These instructors were the early adopters who volunteered to participate in a newly formed professional development opportunity. This list was generated by the self-selection of instructors, assisted in a non-biased list of participants which I did not generate. Participants could volunteer to participate after meeting the required criteria but also needed to have the time to participate in the three interviews. A threat to dependability is having no willing participants.

According to Seidman (2013), having a deep understanding of the issues discussed by those being surveyed and respect for the issues that underlie them, are a better form of proving validity and trustworthiness than devising an audit trail or methods of triangulation. Having a deep understanding of the issues and why researchers are delving into them are more important than mechanical procedures (Seidman, 2013). The

three-interview process in this study provided a way to have three data sources and to verify each response by showing consistency over time.

Confirmability

A field journal was kept during the study where thoughts and follow-up questions were recorded during the interviews. This provided a way to demonstrate how the findings were assessed and conclusions were identified from the study.

Creating an outline of the topics to be covered for the interviews contributed to the trustworthiness of the study as well as a transparent audit trail of all methods used. Field notes were also recorded and evaluated (Moustakas, 1994). A field notebook was composed so the interviewer could keep track of their thoughts and questions that came to mind during the conversations. These notes helped to inform follow-up questions and showed the thinking process of the interviewer. The reflective analysis was used to ensure confirmability in the study. Notes were shared with participants to ensure they were understood and recorded correctly.

My background and position did not create a bias within the limits of this study. At the time that this study was conducted, I have been employed at the university for 5 years. I briefly had a support role within the professional development program when first employed by the university but have not been a part of the group for more than 2 years. I have built a level of trust among instructors in their role with the university as a course designer, technology support person, and a member of the innovative tools in teaching and learning group. I have never been employed through the funding of the professional development program in any way. The professional development program's

supervisory board reports through the Provost's office, while my employment reports through the Chief Information Officer. As an outsider of the program who has been on the inside, I have supported instructors as they worked through their course design and attended the professional development program sessions. This gave me the perspective of an observer in a job that provided access to such instructors from the professional development program.

Ethical Procedures

Participants were asked to sign a consent form before participating in the study which contributed to informed consent before proceeding (Oko, 1992). The entire pool of potential participants was not contacted at once. Only instructors who expressed interest in participating received details about the study. This participant pool had the potential for survey fatigue. Taking this into consideration, the pool of anonymous participants was emailed in groups of 10 until the five were selected for further information, plus the pilot participant, and the consent form was shared. Participants were identified by a code.

All recognized potential bias was reviewed and described. Both Walden's IRB and the selected university's IRB guided the study. The professional development program's management team were asked for permission to contact participants from the program. My job title and background were shared with participants as well as an organizational chart showing how I or the study's results cannot influence tenure, an instructor's job, or professional life. Making it clear no power inequity is involved in the study motivated participants to freely sign the consent form and be more willing to volunteer in the study (Oko, 1992). My involvement in four of the professional

development program's groups was disclosed, the years they were involved (2014-2015), and any working history within their current job between the participant me were disclosed if any existed. I informed the participants that they could withdraw from the study at any time. If a participant withdrew from the study, their materials would have been destroyed and would not have been used in the data collection for the study. Confirmation of the destruction of all materials would have been shared with those who withdraw as well as a thank you message for attempting to participate through email. The consent form for participants included an explanation that they were free to withdraw from the study at any time as well as a description of the risks and benefits to the participants should they decide to participate or withdraw.

Summary

The purpose of this qualitative phenomenological study was to explore the lived experiences and instructor beliefs on teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. Interviews were conducted with instructors and were audio-recorded, transcribed, and imported into NVivo for analysis. The knowledge from this study is intended to be used to inform the professional development program's administrators and staff as to what areas of the program work best at motivating change and inspiring technology use by instructors who have gone through the program. The results could be used to inform universities who are developing similar programs for their instructors in the hopes that such programs can continue to evolve and improve how instructors use

technology in their classrooms to help all students to be more successful in their academic experience.

Chapter 4 will have the results of the study. The analysis and findings of the results will also be discussed.

Chapter 4: Results

Introduction

The purpose of this qualitative phenomenological study was to explore instructors' lived experiences and beliefs regarding teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. The desire was to find common themes across participant experiences and identify whether specific activities promoted technology use. The phenomenon was defined as the Midwestern Tier 1 research institution campus course redesign program. The results of this study may inform the designers of professional development, so that they can know which activities are most associated with activities recommended as being the most useful in inspiring technology use by instructors. An understanding the lived experiences of those who have already been involved in the process and how they think about may inform efforts to make the program better as well as more effective (Yurtseven & Bademcioglu, 2016).

Research Questions

Primary question: How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners?

Subquestion: How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st-century learners?

In this chapter, I present the data and analysis and the results for the research questions guiding this study. This chapter is organized into the following sections: Pilot Study, Setting, Demographics, Data Collection, Data Analysis, Evidence of Trustworthiness, Results, and Summary.

Pilot Study

In that this study involved a researcher-developed interview instrument, a pilot study was needed (Seidman, 2013). A random individual was selected from the participants in the professional development program project to test the instructions, procedures, technology, and allotted time for the interviews. Pilot studies can alert researchers of potential issues in how they ask questions that may detract from the objectives and can assist them in reflecting on their approach (Seidman, 2013). A pilot can also help to determine if an approach is appropriate for a study (Seidman, 2013). This pilot helped to ensure that the questions asked were bringing results related to participants' experiences as required for this investigation.

The impact of the pilot study on the main study was to inform the discussion of technology tools used in the classroom and in the professional development program to happen organically instead of with a formal question. Asking the question directly disrupted the flow of the exchange. Being mindful of the need to pay attention to any technology mentioned for deeper inquiry was the strategy most often used, a change that happened as a result of the pilot.

Setting

The scope of this study was a Tier 1 research institute located in the Midwestern United States. The school, at more than 100 years old, was a STEM-centric institution focusing on engineering and agriculture, as well as business, science, veterinary medicine, health and human services, pharmacy, and education, with established graduate programs (Redacted, 2017a).

The instructors in this study were randomly selected as instructors who had participated in the professional development program (Redacted, 2017b). Because this was a phenomenological study, five instructors were interviewed (plus the pilot) after being selected from the total pool of approximately 150 instructors who completed the program. Instructors who did not complete an entire iteration of the professional development program were excluded from this study. The availability of instructors was a limitation for this qualitative study because instructors often have busy schedules.

Demographics

This was a qualitative phenomenological study. A series of three interviews was conducted with five instructors, plus the pilot instructor, at a Midwestern Tier 1 research institution who had undergone course redesign through the university's professional development program, for a total of 18 interviews.

Table 2

Participant Demographics

	Years of teaching experience	Levels of education taught	Years teaching in a digitally rich learning environment	Level of comfort teaching with technology
Participant 1	18 years	Higher education (undergraduate and graduate) Online	15 years	Moderate
Participant 2	37 years	Higher education (undergraduate and graduate)	5 years	Moderate
Participant 3	7 years	Higher education (undergraduate)	7 years	High
Participant 4	28 years	High school Higher education (undergraduate and graduate)	5-7 years	High
Participant 5	38 years	Higher education (undergraduate and graduate)	20 years	High
Participant 6	11 years	Higher education (undergraduate and graduate)	7 years	Moderate

The first interview covered participants' educational experiences before going through the professional development program. The second interview covered their experiences during the professional development program, and the third covered their teaching experiences after the professional development program. Allowing for time between interviews supports the validity of the interview by placing what participants say in context (Seidman, 2013). This strategy helped me as the interviewer, along with the

participants, to maintain focus on each topic of the series (Seidman, 2013). Each interview helped to inform the next interview, providing for a logical sequence that assisted everyone involved in the phase at hand (Seidman, 2013). Seidman (2013) recommended spacing interviews between 3 days and a week apart. This approach provided time for participants to think about the previous session but not enough time for them to forget about the previous session (Seidman, 2013). It is of utmost importance to allow time for reflection between topics but not so much time that the thoughts from the previous interview are no longer fresh enough to inform the next interview (Seidman, 2013).

Data Collection

Instructors selected to participate were drawn initially from the earliest participants of the professional development program in 2011, after which I moved up the list toward the most recent participants. Instructors were selected in this manner so that participants would have had the most time to integrate what they had learned and been likely early innovators, helping to create a culture for change. This group of instructors was a random selection of individuals who self-identified as wanting to participate in the program. The entire pool of participants was 312 instructors. Only those who had taught the class that they redesigned at least once were eligible to participate. They were given a survey outlining the criteria before being interviewed. Six instructors volunteered, qualified for the study, and were interviewed—two women and four men.

Interviews were recorded with WebEx audio only. I used a field notebook to write down thoughts and follow-up questions during the interviews. The themes of inquiry

were: beliefs and pedagogy related to teaching and technology use. Strategies such as not interrupting and listening carefully to what is said, according to Seidman (2013), are the most effective ways to gather the essence of the experience of those being interviewed. No variations or discrepant cases deviating from the plan presented in Chapter 3 occurred.

Data Analysis

Data were categorized according to the research questions using WebEx for collection, and NVivo was used for analysis after transcription. After each recorded interview, the data were transcribed, after which the software tool NVivo was used to code and investigate themes discussed in the interviews. NVivo is a well-established tool for qualitative research that is used for coding transcribed videos based on Saldana's (2016) strategy. Concepts and patterns within topics were coded, and related sub nodes were identified (Saldana, 2016). The themes that emerged were technology integration, inclination to use technology, support surrounding the use of technology, the professional development program, technology use after the professional development program, and related beliefs associated with teaching and learning. They became coded as technology integration, Rogers's theory of innovation, SAED framework, and beliefs and change. The themes were then sorted according to the related research questions, as seen in Table 3.

Table 3

Themes

Research question	Themes
1. How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners?	1. Technology integration 2. Rogers's theory of innovation 3. SAED framework
2. Subquestion: How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st-century learners?	4. Beliefs and change

Discrepant cases were not an issue with this investigation because the professional development program was evolving after every iteration, and only two participants were in the same iteration. Even though participants generally experienced different versions of the professional development program, each program had the same objectives (Redacted, 2017b). For example, Participant 4, who took part in an early iteration of the program, taught a very large enrollment course and was encouraged to use more essay assessments. Because Participant 4 knew that this was not a realistic expectation for a course with hundreds of students, this instructor shared that this was not helpful feedback. The program facilitators agreed and changed future iterations. Other participants from future iterations of the program who also taught large-enrollment courses had a more positive experience with the assessment evaluation portion. Those administering the professional development program likely changed this part and stopped

asking large-enrollment instructors to include essay assessments. Because discrepancies existed between experiences of the participants, each experience was evaluated as an individual perspective, and all were valued as relevant.

Evidence of Trustworthiness

Issues of trustworthiness for qualitative research are important because the qualitative researcher aims to increase understanding of a phenomenon—in this case, going through the same professional development program. Being able to trust the results is an important aspect of having credible results (Merriam, 1998). Credibility, confirmability, dependability, and transferability are important elements of trustworthiness for the results of a study. Qualitative researchers need to be mindful of the need to conduct ethical research (Merriam & Tisdell, 2015).

Credibility

Using a three-interview strategy helps to ensure credibility (Oko, 1992). This approach helped me to place comments made during the interviews in the proper context and assisted in providing consistency in what participants were saying (Oko, 1992). Comments made in the first interview, for example, should align with the thought processes described in the latter two interviews. The passage of time while showing consistent thoughts helps to ensure validity (Oko, 1992). This interviewing strategy addressed how the participants made meaning of their experiences for 1-3 weeks. Having more than one participant allowed me to check comments against others, thereby gaining multiple perspectives on the same phenomena (Oko, 1992). Being transparent with participants in allowing them to view notes and transcripts contributed to credibility

(Merriam & Tisdell, 2015). This helped to ensure that what was said was not interpreted incorrectly, which could have posed a threat to validity (Merriam & Tisdell, 2015). Validity is supported when participants can make sense of their experiences to themselves while going through the process of interviews (Oko, 1992). Phenomenology is about describing experiences without analysis of the experience by the researcher (Moustakas, 1994).

The creation of the pilot study helped to establish credibility by testing validity and helping to ensure that the responses focused on what was needed for this study (Seidman, 2013). Validity was also addressed by using the three-interview structure because it places comments in context and allows for participants, during the time between interviews, to check the consistency of what they say (Seidman, 2013). If the structure of the interview allows instructors to make sense to themselves and the researcher, it contributes toward validity (Seidman, 2013).

Transferability

I selected voluntary participants from a list of instructors who had already participated in the professional development program at the university. The participants in the professional development program were a collection of instructors who willingly decided to participate in the program, as well as instructors whose departments asked them to participate. Participants were from most disciplines and schools across the university's campus (Redacted, 2016b). Other universities with similar demographics and emphasis on research that have professional development opportunity structures like the

professional development program in this study may benefit from the results and be able to transfer the results to their setting.

The most important measure for ensuring transferability is targeting early adopters (Rogers, 2003). Early adopters who volunteered to be part of the professional development program first exhibited the qualities that Rogers (2003) referred to as a willingness to change. As the professional development program progressed over several years, eventually many more participants attended because they were required by their departments to do so (Redacted, 2016b). Because these instructors would not be considered early adopters, they might not exhibit the same willingness to change.

Dependability

Understanding the random sample generated by the professional development program team's list of participants helped to inform the external validity of the study. These instructors were early adopters who volunteered to participate in a newly formed professional development opportunity. As this list was generated by the self-selection of instructors rather than being generated by me as the researcher, it was a relatively nonbiased list of participants. Participants could volunteer to participate after meeting the required criteria; they also needed to have time to participate in the three interview sessions.

According to Seidman (2013), a deep understanding of the issues discussed by those being surveyed and respect for the issues that underlie them are better for proving validity and trustworthiness than devising an audit trail or methods of triangulation. A deep understanding of the issues and why one is delving into them is more important than

mechanical procedures (Seidman, 2013). The three-interview process provided a way to have three data sources and to verify each response by showing consistency over time.

Confirmability

A field journal was kept during the study where thoughts and follow-up questions could be recorded during the interviews. This provided a way to demonstrate how the findings were assessed and conclusions were identified from the study.

Creating an outline of the topics to be covered for the interviews contributed to the dependability of the study as well as a transparent audit trail of all methods used. Field notes were recorded and evaluated (Moustakas, 1994). A field notebook was composed so that I could keep track of their thoughts and questions that came to mind during the conversations. These notes helped to inform follow-up questions and show the thinking process of the interviewer. The reflective analysis was used to ensure confirmability in the study. Notes were shared with participants to ensure they were understood and recorded correctly as needed.

My background and position should not have created a bias within the limits of this study. At the time this study was conducted, I will have been employed at the university for 5 years. I briefly had a support role within the professional development program when first employed by the university but have not been a part of the group for more than 2 years. I have built a level of trust among instructors in their role with the university as a course designer, technology support person, and a member of the innovative tools in the teaching and learning team. I have never been employed through the funding of the professional development program in any way. The professional

development program's supervisory boards report through the Provost's office, while my employment reports through the Chief Information Officer. As an outsider of the program who has been on the inside, I have supported instructors as they work through their course design and attend the professional development program sessions. This gives me the perspective of an observer in a job that provides access to such instructors from the professional development program.

Results

Theme 1: Technology Integration

All the participants were asked about their use of technology before, during, and after the professional development program. Often the subject of technology arose organically in the conversation. If it did not, the interviewer asked them about their experiences and if they learned about technologies they later used, during the professional development program. The participants had a wide range of technology experiences before the professional development program as demonstrated in Table 1. Participants 2 and 5 had the most experience teaching and they witnessed the introduction of technology into their classrooms by way of media and PowerPoint slides. Both Participants used these technologies before the training program. All the participants with one exception did not learn about new technology at the professional development program that they later implemented within their class. Participant 3 found the technology that was shared during the professional development to be very useful: "I found (redacted) really helpful in a large class. We were really trying to create that small class experience in a large class and one of the biggest problems is losing track of people.

(Redacted) became really important." Participant 1 rejected technology that was shared during the professional development program.

> They did a fine presentation of what a (digital application) could do and what it was capable of. I ultimately said, "You know, I think I'm going to just not utilize that." I remember thinking, "Is it worth it?" The leap to learn the new technology, to implement it my class, to work through all the kinks. Will I get enough value out of it and at the end of the day, I actually decided, no.

Participants mentioned iClickers a total of 20 times on their own accord. Most of the participants had heard about iClicker before the professional development program. Two had already used it. Participant 1 decided against trying it. "I didn't like iClickers because iClickers cost money. I wanted to try to minimize for my students what they were already paying. I don't need to charge them more to buy an iClicker".

Participant 4 ended up utilizing a digital application they learned about after the program by utilizing the support network she got to know better during the professional development program.

> Because we have this teaching and learning technology group and because I've developed relationships with them, I know I can go to them and talk about my next idea to improve classroom learning. I can say, "Hey, what do you think of this?" and I have someone who is at the forefront of using technology to support student learning who can say, "Ok, well, have you considered this?" and it will be something that I haven't really thought of yet. I can ask them, "How do we leverage all the technology that we have with these crazy ideas I get and make

> them come together and be even better?" I guarantee you, if (one of these technology support people) wouldn't have been sitting there with me, helping me consider how can we use (redacted), I don't think I would have come up with that.

Some participants had a very different experience with the technology portions of the professional development program and they wondered if perhaps the late phase of his or her career created an additional barrier. Participant 2 said:

> I'm not particularly interested in a lot of Technologies that I wasn't comfortable with because I was pretty late in my career before I did (the professional development program). I think I didn't benefit as much from the technology person's ideas as I should have. I was intimidated by the technologies.

Participant 6 mentioned some of his frustrations related to implementing technology in his courses and the support necessary for continued use.

> One of my biggest frustrations is they get these (technology tools) out and then they don't stick with them. It is also frustratingly difficult to find out about tools. If I want to add a specific tool to a thing, just finding the ins and outs of it I think, is really challenging.

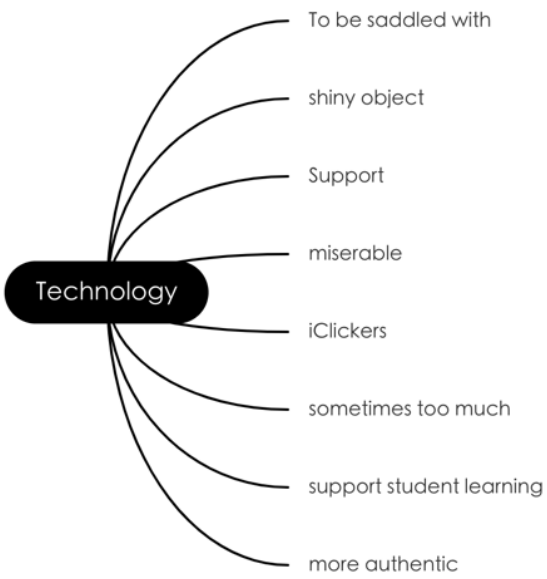

Figure 1. Research Question 1, related themes.

Some participants remembered clearly the technologies demonstrated during the professional development program while others did not remember seeing anything introduced that was new to them.

Figure 1 shows the wide range of words related to technology used by participants. It was clear, all participants had strong opinions that varied from positive to "miserable". Having a strong support structure made a huge difference for some participants while others, such as Participant 1who described themselves as having moderate technology skills, decided not to utilize it.

Theme 2: Rogers's Theory of Innovation

Since investigating technology integration as it happens through professional development is a question addressed in this study, Rogers's (2003) innovation theory provided the technology integration lens in which to examine the data. The diffusion of

innovation theory was used to see if these early adopters of this professional development program, began to initiate a culture of change related to beliefs about technology use across campus. Rogers's (2003) theory provides a way to examine barriers and refers to them as the innovation-decision process. The nature of this study was to target those who first enrolled in the professional development program, often the early adopters. Participant 4, is an individual who participated in an early iteration of the program shared:

> I think you can't talk about these early (iteration of the professional development program) without talking about who are the early adopters. That has a lot to do with the first class of (the program). These people that jumped at the opportunity (of the professional development program) knew it wasn't going to be new information. They already bought in.

The individual who participated in the earliest iteration of the professional development program was already well versed in the use of the technology that was shared at the time in the program that related to teaching and learning. Participant 1 said, "They emphasized the learning management system more and that's a perfectly fine thing to have done". Available technology applications that were supported on campus were very limited at the time.

A self-identified laggard to technology adoption was represented in Participant 2. Participant 2 shared:

> I wish now that I had done things differently. I wonder things like had I used (redacted digital application) had (students) vote on their phone for responses to

> different questions and see the results, it might have helped me realize how badly I had transferred the information to the students. I wish I had done some of those things because it would have been more immediate feedback and I would have known more.

Timing, comfort level, support, and available technologies seemed to influence the diffusion of digital innovation by participants and these issues appeared to influence use more than a willingness to try new things. It was unclear if any Participant was able to contribute to a culture of technology use within the campus.

Theme 3: SAED Framework

The SAED Framework says that for change to be possible, an instructor's beliefs and organization must be continually evolving and improving for change to be supported and encouraged (Holdsworth & Thomas, 2015). The SAED framework is intended to predict if conditions exist for change to happen in how an instructor teaches (Holdsworth & Thomas, 2015). Participant 2 felt the university was one that was supportive of teaching and learning.

> At (Redacted university name) we're not supposed to just be excellent teachers we actually should have scholarship about our teaching. It is very encouraging that we're in an institution where there's a lot of emphasis on teaching and learning and I think our administration has continued to push in that direction. That's exciting to me we're not just a research institution.

Participant 3 had a different experience when this participant tried to initiate the use of a specific technology device. He or she shared:

> When we were in (the professional development program), we wanted to have iPads in the classroom and we were blocked by (tech support) who would not let us purchase an iPad cart even with our own money. That was really frustrating because we had what we thought was a good answer to some of our problems and we couldn't do it so I was pretty grumpy during (the professional development program). But I was grumpy not because of the events of where I was but because of the institutional barriers that were in front of me teaching.

Institutional support covers a broad area and Participant 6 related it to a possible inclination for faculty to hesitate investing in their advancement related to teaching and learning. This participant related this personal experience:

> The first year that I got to (redacted university) I won a teaching award. Which was great. I was really excited about it. But then I really got a feeling that if you work on your teaching then it probably means you're not researching enough. And you know there was this really sort of a back channel. There was a period of time where I wished I'd rather not have that award. Because you know I don't want people to think that I'm spending more time on teaching. You know I really need to develop a reputation as a researcher and this is not helping me. I just want to be clear that going through a (professional development) program does not help you get tenure.

The emphasis on research, especially seen at research-centric universities, is a primary focus for staff promotion and institutional ranking (Dickson et al., 2016). Investing in good teaching is often considered to be an indication of not taking research

seriously in many research institutions of higher education (Jawitz & Perez, 2015). A lack of respect for taking the time to teach well is a part of the culture (Jawitz & Perez, 2015). Universities generally do not convey how they desire instructors to balance their time (Jawitz & Perez, 2015; Stupnisky et al., 2017).

Theme 4: Beliefs and Change

The change that instructors shared that happened because of the professional development program varied from "I think the core of my teaching basically stayed the same" to Participant 6 who referred to the program as a "liberation". Going through the program liberated them from feeling like "I have to summarize this entire textbook in power points so I can cram this knowledge into their heads". The participant described:

> You're handed the curriculum and you're handed the textbook at the same time. The implied burden is that you'll get through the material in the textbook. There is guilt associated. You think, "oh my God, I didn't finish". (I felt like) I let them down, you know. It's only with confidence and with a different mind frame I learned I don't need to teach everything in this book and I'm confident in saying, "Well they don't need that but they can do this" that changes the whole dynamic.

Creating well-written objectives became a significant learning point for four of the six participants. The two exceptions had already embraced the concept and had been designing their courses with them before the program. Those who benefitted from learning about designing courses with learning objectives who learned during the professional development program attributed them with a more focused approach to their teaching. Participant 6 added:

> The challenge is getting good learning objectives and workable ones. That was really the key observation for me and what that meant to me. It really became clear in my mind that the less I spoke the more learning was likely to happen.

Participant 2 remembered how they thought of teaching before they learned about designing with objectives:

> I thought that it was our job to impart information, transfer information from me to the students in a way that they would think it was important. I wasn't very deliberate or organized about how I was structuring the course to make sure I was accomplishing what I wanted.

Participant 5 remembered in more detail the challenge of the learning objective lesson in the program:

> Intellectually instructors know what the learning objectives are. The challenge was to boil these down and put them into writing because I don't know that any of us ever do that exercise. To be able to verbalize or explain and in a few simple sentences what those are. I think that was a very useful exercise so then it becomes clear. Once you have that, it's clear to them (it is) also clear to the students. We have it in our heads but I don't know that it's ever been boiled down quite so concisely so that was a challenge to do but it was it was a good challenge.

Nearly every participant mentioned the benefits of collaboration with their peers. Taking the time to just focus on their course with a group of peers was overwhelmingly the most frequent gain mentioned from the professional development program. Participant 5 shared: "Every time there's an opportunity to interact with colleagues you

know this seems to me there's a good likelihood something good will come out of it". Participant 4 shared "It was certainly validating to be in a community of people thinking about their teaching and trying to improve their teaching. I like that".

Three participants mentioned how they benefitted from hearing a former participant present to the group how they benefitted from the program and the changes they implemented in their course. Participant 2 said this presenter, "inspired me" and added, "if I could do just a third of this, it would be really good". Again, those peer relationships were attributed as beneficial. None of the staff speakers were mentioned by participants but they remembered their peer and details of his presentation.

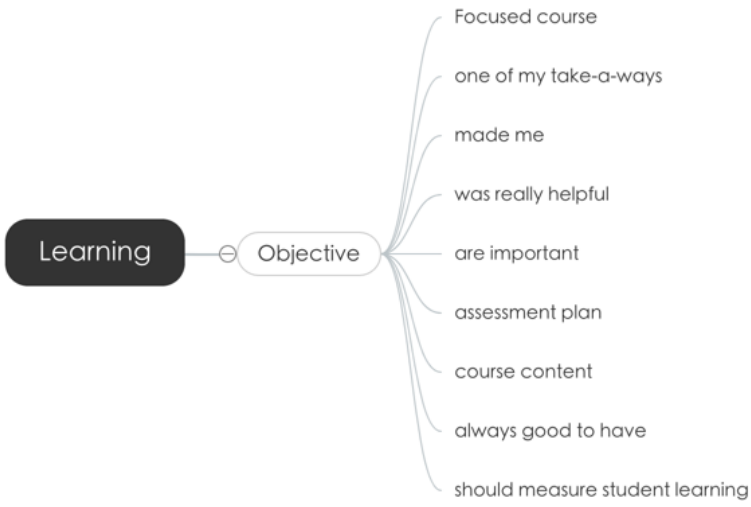

Figure 2. Research Question 2, related themes with subthemes.

Creating learning objectives were described by all the participants as being a valuable experience. For the four who learned about them for the first time at the professional development program, they all mentioned this as helping to create a significant shift in how they designed future learning experiences. This was the most

significant actionable point learned that had the greatest lasting benefit for participants who learn it for the first time.

Participants learned new concepts by way of the program's Blackboard course that had materials posted, staff and guest speakers, homework, and by way of learning activities during their class time. However, not all participants were able to utilize all available resources and expected homework activities due to teaching obligations. Participant 1 remembered, "No one seemed to notice that I just kind of sloughed off that particular week's assignment". Most Participants did not mention having a problem doing the expected homework.

Participant 1 added,

> The program forces you to sit down and think about your class for a defined period-of-time. People are always fighting for your time outside of a classroom environment and when you're in the class you know there's an hour and a half where the only thing I'm really doing at this moment is thinking about how I might redesign my class and what I might do. I think that was useful. That's a useful take away from (Redacted program name) because it forced you to do that for your class for at least that hour and a half.

Results by Research Question

Research Question 1

Research question one asked: How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners?

Participation in the professional development program experienced by those in this study did not overwhelmingly change the beliefs of those interviewed related to how they taught with technology. Only one participant learned of a technology tool in the program who then implemented it. However, several participants utilized the technology support team after the program for the support of digital tools learned about later. Several participants keeping these support relationships going for many years after and Participant 4 noted collaborations with this team related to research opportunities, publication, and tool development. All participants mentioned benefits from hearing from peers from other disciplines, with other backgrounds.

Research Question 2

Research question 2 asked: How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st-century learners?

Participation in the professional development program referred to in this study changes the beliefs of instructors who learn how to create learning objectives within their courses and then map their activities and their assessments to those learning objectives. It also helps to "liberate" instructors, as Participant 6 said, to not feel so overwhelmed by thinking they have to cover their entire textbook as mentioned above. While learning objectives are not specific to 21st-century learners, having clear learning objectives with activities and assessments that directly map to them are important for all learners to make sure they are staying on topic in the courses they take and spend their time on what is most important and to be assessed on these same things.

Summary

The purpose of this qualitative phenomenological study was to explore the lived experiences and instructor beliefs on teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. Using three interviews with all 6 participants, assisted in answering the research questions: How has participation in a professional development program changed the beliefs of instructors surrounding technology integration in how they respond to the learning styles of 21st-century learners? How have lived experiences changed the beliefs of instructors after participation in a professional development program toward how they teach 21st -century learners? Assisting instructors in the implementation of technology due to the program was harder to identify since all but one participant did not utilize technologies shared during the program. However, several utilized the technical support group for technology solutions after the professional development program ended.

A change in practice due to attending the professional development program was easier to identify for instructors who implemented objectives for the first time. Most Participants changed their classroom practices by implementing learning objectives in the design of their course and by mapping activities and assessments to them. In Chapter 5 I discuss an interpretation of the study's findings, limitations, recommendations, implications, and the conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this qualitative phenomenological study was to explore instructors' lived experiences and beliefs regarding teaching and technology integration before, during, and after completion of a professional development program at a Midwestern Tier 1 research institute. The desire was to find common themes across participant experiences and identify whether specific activities promote technology use. At the early stage of the study, the phenomenon was defined as the Midwestern Tier 1 research institution campus course redesign program.

For this qualitative phenomenological study, a series of three interviews was conducted with five instructors at a Midwestern Tier 1 research institution who had undergone course redesign through the university's professional development program, for a total of 15 interviews. The first interview covered participants' educational experiences before going through the professional development program, the second covered their experiences during the professional development program, and the third covered their teaching experiences after the professional development program.

A qualitative phenomenological design was chosen because it provided a lens that would allow for the examination of the experience of the professional development program, as interpreted by instructors. It is a person's perception of their experiences that become their reality (Husserl, 1931; Moustakas, 1994). A phenomenological approach provided a more in-depth view of instructors' impressions of their experience after the redesign process and their beliefs related to teaching and learning.

Key findings were that all participants benefited from the professional development program. Every participant pointed to the benefit of collaborating with peers. Most participants benefited from learning about the use of learning objectives in their course design. Mapping assessment questions to learning objectives as well as assignments was something that most of the participants did not know how to do before this experience. Most participants did not learn about new technology at the professional development program that they used with students or in their teaching. However, several benefited after the program from the relationships that they developed with members of the technical support group and later implemented technology with their assistance and support.

Interpretation of the Findings

In this section, I present interpretations of the findings aligned with the conceptual frameworks of Rogers's theory of innovation and SAED. I then discuss interpretations related to relationships, technology integration, and institutional support.

Interpretations of Findings Relevant to Rogers's Theory of Innovation

Barriers still exist around the integration of technology (Brinkerhoff, 2006; Hsu, 2016). Lack of administrative support and lack of adequate equipment have inhibited technology integration (Ashrafzadeh & Sayadian, 2015; Reid, 2014). Early adopters often simply replaced current practices with technology and cited a lack of support and training for their remedial use (Ertmer et al., 2015). Nevertheless, instructors commented that when they used technology in their teaching students were more engaged, energetic, focused, and interactive in the learning process (Overbaugh & Lu, 2009).

Little support for technology integration is provided in many institutions (Brinkerhoff, 2006). Conflicting messages were noted by Jawitz and Perez (2015) in their research on career advancement criteria and public messages related to teaching and learning. They found that instructors who invested in their professional development in classroom instruction had an agenda driven by a personal passion for teaching and learning (Jawitz & Perez, 2015).

Interpretations of Findings Relevant to SAED Theory

Most participants in the professional development program learned new pedagogies during the sessions that they implemented in their courses and often in future courses. Researchers who investigated professional development in STEM in higher education reported that a program called FIRST, which was designed for postdoctoral scholars, taught instructors who completed the program to be more student centered in their teaching than those who did not take part in the program, with participants able to demonstrate this student centeredness in their teaching (Derting et al., 2016). They found that beliefs change slowly but have a direct impact on how instructors teach (Derting et al., 2016). They validated their results with external reviewers who came to the same conclusions (Derting et al., 2016). This study helps to show that although research is limited in higher education related to professional development, this body of research is beginning to grow and is consistent with the existing literature about beliefs and changed practice in the classrooms of higher education. The research also shows that instructors were able to learn and possibly change their beliefs through a professional development program and then change how they taught (Derting et al., 2016). For SAED to happen,

individuals need to be continuous learners, be open to change in instruction, and participate in professional development (Holdsworth & Thomas, 2015).

Relationships and Professional Development

Most participants in the professional development benefited in terms of personal growth and as instructors by communicating with their peers and by hearing peers talk about strategies that worked for them. At times, participants forged relationships through the professional development program that lasted for years after the program was over.

Instructors with more professional development in higher education tend to have more self-efficacy compared with instructors with less training (Derting et al., 2016). Reflection and collaboration with peers for professional development are crucial but missing elements in traditional higher education (Leigh, 2016; Nicholls, 2001). Programs shown to have more of a lasting benefit are ones that provide for follow-up and collective participation (Kennedy, 2016). Providing an environment where instructors can collaborate, learn, and reflect with colleagues is important in professional development in higher education (Leigh, 2016; Nicholls, 2001). Collaboration has also been noted to be important for instructors in contributing to a positive work environment and enjoyment in their careers. The development of a professional identity occurs through community membership and becoming part of a culture (Barbarà-i-Molinero et al., 2017; Trede et al., 2012). Beliefs reflect the individual like a lens reality is filtered through, while knowledge is related to the community (Donovan et al., 2015; Vygotsky, 1978). Trede et al.'s (2012) research concluded that once individuals become professionals, they start to accumulate knowledge and skills like their peers. This sets them apart from those not in

their field, creating a professional identity linking them to their peers and profession (Barbarà-i-Molinero et al., 2017; Trede et al., 2012). In this way, being a member of the profession becomes a part of their identity (Trede et al., 2012).

Technology Integration and Professional Development

Most participants in the professional development program benefited from learning about professional technology resources available to them. This benefit could last for many years after the program ended and could become a part of the teaching support structure they counted on.

Several studies have shown that instructors who are more traditional in their beliefs often use more instructor-centered technologies, whereas more constructivist instructors tend to use more student-centered technologies (Ertmer et al., 2015). There is a correlation between having experienced technology-rich learning as a student with having positive beliefs about how technology can contribute to student learning (Salleh, 2016). Researchers have found that several factors predict teachers' use of technology in teaching, such as their personal beliefs about teaching. Instructors with constructivist views have been found to be more apt to accept teaching with technology as opposed to those with traditional views (Teo & Zhou, 2016). Additionally, the longer an instructor teaches, the more traditional the instructor's views are likely to seem, and less likely the instructor is to teach using technology (Teo & Zhou, 2016). The biggest predictors of technology use by instructors were noted to be perceived usefulness, high self-efficacy, and student expectations, but their beliefs and the culture in which they work are the key

components in predicting technology use by instructors (Ertmer et al., 2015; Sadaf et al., 2016; Salleh, 2016; Tondeur et al., 2016).

Instructors who have seen their peers using technology or implementing change have been widely successful in promoting change (Ertmer et al., 2015). Some have found that they can help create a culture of technology integration and innovative attitudes about learning by promoting successful professional development programs (Ebert-May et al., 2015). Designers of one professional development program were even successful when only a limited number of instructors engaged in a 2-year activity (Ebert-May et al., 2015). Learning to develop collective efficacy could help such success spread thorough an entire department and even across schools (Tschannen-Moran et al., 2015).

According to Rogers (2003), this part of innovation related to communication between peers is where a network of support for using the tool might be created. Communication channels can develop when experienced users assist new users, or when a tutorial is engaged in the form of a book, video, or television show (Rogers, 2003). Rogers (2003) used the word *homophily* to describe the degree to which two people have beliefs and lives in common and *heterophily* to describe differences between people. Communication happens best between people who have more in common, or who are homophilous (Rogers, 2003).

Institutional Support and Professional Development

Not all instructors feel that they receive adequate institutional support for teaching and learning. Instructors may see themselves as researchers who teach, not teachers who conduct research. Instructors in higher education tend to see themselves as researchers

and topic experts, rather than as teachers (Nicholls, 2001); however, some universities are trying to change this. University instructors are not rewarded for teaching, and promotion is usually tied to research (Deaker et al., 2016; Hassan, 2013; Jawitz & Perez, 2016; Nygaard, 2017). Research is thought by many to be the primary purpose of higher education and necessary for its future (Nygaard, 2017). Those who focus on teaching risk compromising their careers and reputations in their field (Hassan, 2013). Instructors also often do not have support or preparation in the art of teaching (Hellmann et al., 2014).

There is currently a culture in higher education in which research brings rewards, recognition, funding, and tenure for instructors. Faculty within research-driven universities have traditionally viewed teaching as an extra responsibility, almost as a distraction from their research, and have not factored in classroom success with tenure (Deaker et al., 2016; Van Schalkwyk et al., 2015). Instructors have limited time and competing responsibilities as they move up the ranks in higher education. Spending time learning how to improve teaching may be viewed as unnecessary for attaining tenure or success in higher education (Van Schalkwyk et al., 2015).

Limitations of the Study

Limitations of this study included my bias due to a career invested in instructors' professional development. I sought to address this bias by having the instructors describe their experiences in the professional development program, rather than making assumptions as to what occurred. Another limitation of the study was the inability to address all the concerns gathered from instructors. To address this limitation, I will share the results of the study with the professional development program management team.

Threats to quality were possible because two instructors admitted to not fully participating in the professional development program. They were not always able to complete homework and readings due to their busy schedules. This was addressed by focusing on the transfer of what they had learned into other courses they had taught since the professional development program. One unexpected limitation was the work history I had with all but one participant. Participants who had worked extensively with me appeared to share more information, which likely had the effect of omitting the perspectives of instructors who were not comfortable using technology in their courses. Participants' likelihood of sharing negative information also seemed to be related to how much they had worked with me in the past, suggesting that trust was an important factor. More extensive history with me appeared to correlate with more sensitive information shared.

Recommendations

The professional development program offers benefits to instructors. It promotes collaboration with peers, it helps instructors learn how to design better courses, and it promotes technology integration in teaching and learning by helping instructors find supportive groups on campus that can help them. Instructors have benefited from the program. The following are recommendations for similar programs based on the results of this study:

1. More activities should be included in professional development to encourage peer interactions and networking with support groups on campus.

2. A collaboration portion should be added so that instructors can easily maintain relationships with peers they connect with during the program after the program is over, in order to cultivate encouraging environments where mentorships can grow.
3. Technology support specialists need to cultivate relationships with instructors in these programs. They need to remember that these relationships can lead to technology use later, even if no interest in shared technology is evident during the program.

The following recommendations for further research to extend knowledge in this field are based on the results of the study.

1. Studies that explore the benefits of cross-discipline interaction for determining whether discipline-centric or cross-discipline grouping in professional development programs is more beneficial.
2. Studies that explore what specifically inspires technology use in teaching and learning for determining how to predict and inspire use.
3. Studies that explore the benefits of voluntary professional development participation over mandated participation to determine if relationships can still form and if benefits can still be experienced by participants when they are required to attend a professional development program.

Implications

Leaders within universities struggle with how to implement effective professional development (Ebert-May et al., 2011). Examining the crucial link between belief and

practice is a significant step in learning how to implement change in this area (Ertmer et al., 2014). This study helps to show the benefits of professional development for instructors in higher education.

Individuals' social identities as instructors are shaped by watching others teach and being a part of a culture. Gradually, as instructors see more technology being used in teaching and learning, their experiences contribute to a culture of technology users. By helping future instructors see technology being used in a meaningful way, it may be possible to help them perceive educators as those who teach with technology (Ertmer et al., 2015; Zembylas & Chubbuck, 2015). Providing incentives for instructors to share and learn from each other can be accomplished with professional development activities hosted by universities. It is recommended that more activities be included that encourage peer interactions, networking with support groups on campus, and adding a collaboration portion through which instructors can easily maintain relationships with peers whom they found during the program.

This study may support positive social change by helping to validate such programs and may inspire future research opportunities. Exploring if it might be possible to construct a facilitated development program that is led by instructors could potentially contribute to a better program design and inspire collaboration between groups of instructors from different areas of expertise working together. Investigating if such a program would inspire peer collaboration and lasting relationships across disciplines could benefit individuals and organizations by providing richer research opportunities, which might help society solve the large problems that Tier 1 research institutions take

on, such as food production, cancer research, and environmental conservation. Individuals can benefit from having peers to share challenges with and this collaboration can bring higher job satisfaction, research opportunities, and over-all career success which can help their families by reducing job related stress during the pressure of trying to attain tenure.

Conclusion

I attempted to identify what happens in professional development activities in higher education that inspire the use of technology in teaching and learning. The results show that relationships were the key to change, as was validated in the literature. A consistent theme in this study was the power of relationships. Participants noted relationships with their peer presenters as helping them the most in understanding how to implement learning objectives. Changes in teaching and learning, as well as belief change, were influenced by peers and those whom participants met during the professional development sessions. Additionally, those they remembered after the program as having the greatest lasting impression were those to whom they could relate. A significant conclusion could be made that to promote change in teaching and learning, positive relationships must be created and maintained for instructors that involve peers as well as those who support instructors' efforts in the classroom.

References

Aldunate, R., & Nussbaum, M. (2013). Teacher adoption of technology. *Computers in Human Behavior*, *29*(3), 519–524. http://doi.org/10.1016/j.chb.2012.10.017

Ashrafzadeh, A., & Sayadian, S. (2015). University instructors' concerns and perceptions of technology integration. *Computers in Human Behavior*, *49*, 62–73. http://doi.org/10.1016/j.chb.2015.01.071

Ashton, P. (2015). Historical overview and theoretical perspectives of research on teachers' beliefs. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 31–47). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Barbarà-i-Molinero, A., Cascón-Pereira, R., & Hernández-Lara, A. (2017). Professional identity development in higher education: Influencing factors. *International Journal of Educational Management*, *31*(2), 189–203. http://doi.org/10.1108/IJEM-05-2015-0058

Barnes, N., Fives, H., & Dacey, C. (2015). Teachers' beliefs about assessment. In H. Fives & M. Gill (Eds.), *International handbook of research on teacher beliefs* (pp. 284–300). New York, NY: Taylor & Francis. http://doi.org/10.1007/s13398-014-0173-7.2

Baytak, A., & Akbiyik, C. (2010). Classroom teacher candidates' definitions and beliefs about technology integration. *World Academy of Science, Engineering and Technology*, *66*, 90–94.

Berger, P. (2017). Beyond plain acceptance or sheer resistance: A typology of university

instructors' attitudes to students' media use in class. *Teaching and Teacher Education*, *67*, 410–417. http://doi.org/10.1016/j.tate.2017.07.009

Borg, M. (2001). Teachers' beliefs. *ELT Journal*, *55*(2), 186–188. http://doi.org/10.1097/01.chi.0000187243.17824.6c

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, *33*(8), 3–15. http://doi.org/10.3102/0013189X033008003

Brantley-Dias, L., & Ertmer, P. (2013). Goldilocks and TPACK: Is the construct "just right"? *Journal of Research on Technology in Education*, *46*(2), 103–128. http://doi.org/10.1080/15391523.2013.10782615

Brinkerhoff, J. (2006). Effects of a long-duration, professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education*, *39*(1), 22–43. http://doi.org/10.1080/15391523.2006.10782471

Brown, M. (2016). Blended instructional practice: A review of the empirical literature on instructors' adoption and use of online tools in face-to-face teaching. *The Internet and Higher Education*, *31*, 1–10. http://doi.org/http://dx.doi.org/10.1016/j.iheduc.2016.05.001

Bue, S., & Divjak, B. (2016, September). *Environmental factors in the diffusion of innovation model: Diffusion of e-learning in a higher education institution*. Paper presented at the Central European Conference on Information and Intelligent Systems, Varazdin, Croatia.

Buehl, M., & Beck, J. (2015). The relationship between teachers' beliefs and teachers'

practices. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 66–84). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Chickering, A., & Gamson, Z. (1991). Seven principles for good practice in undergraduate education. *New Directions for Teaching and Learning*, *47*, 63–69. http://doi.org/10.1002/tl.37219914708

Chien, S., Wu, H., & Hsu, Y. (2014). An investigation of teachers' beliefs and their use of technology-based assessments. *Computers in Human Behavior*, *31*, 198–210. http://doi.org/10.1016/j.chb.2013.10.037

Christesen, E., & Turner, J. (2014). Identifying teachers attending professional development by their stages of concern: Exploring attitudes and emotions. *The Teacher Educator*, *49*(4), 232–246. http://doi.org/10.1080/08878730.2014.933641

Coultman, J. (2015). *Motivating higher education faculty for technology integration: A private college's approach* (Doctoral dissertation). Retrieved from http://scholarworks.waldenu.edu/dissertations

Creely, E. (2016). "Understanding things from within". A Husserlian phenomenological approach to doing educational research and inquiring about learning. *International Journal of Research and Method in Education*, *41*(1), 1–19. http://doi.org/10.1080/1743727X.2016.1182482

D'Souza, J., & Gurin, M. (2016). The universal significance of Maslow's concept of self-actualization. *Humanistic Psychologist*, *44*(2), 210–214. http://doi.org/10.1037/hum0000027

Dahlstrom, E. (2015). Educational technology and faculty development in higher education. *EDUCAUSE Report*, 3–35. Retrieved from http://www.educause.edu/library/resources/educational-technology-and-faculty-development-higher-education

Dahlstrom, E., & Brooks, C. (2014). *Study of faculty and information technology, 2014*. *ECAR Study of Faculty and Information Technology*. Louisville, CO.

Dandy, K., & Bendersky, K. (2014). Student and faculty beliefs about learning in higher education : Implications for teaching. *International Journal of Teaching and Learning in Higher Education*, *26*(3), 358–380.

Darban, M., & Polites, G. (2016). Do emotions matter in technology training? Exploring their effects on individual perceptions and willingness to learn. *Computers in Human Behavior*, *62*, 644–657. http://doi.org/10.1016/j.chb.2016.04.028

De Vries, S., Jansen, E., & Van De Grift, W. (2013). Profiling teachers' continuing professional development and the relation with their beliefs about learning and teaching. *Teaching and Teacher Education*, *33*, 78–89. http://doi.org/10.1016/j.tate.2013.02.006

Deaker, L., Stein, S., & Spiller, D. (2016). You can't teach me: Exploring academic resistance to teaching development. *International Journal for Academic Development*, *1324*(August), 1–13. http://doi.org/10.1080/1360144X.2015.1129967

Derting, T., Ebert-May, D., Henkel, T., Maher, J., Arnold, B., & Passmore, H. (2016). Assessing faculty professional development in STEM higher education: Sustainability of outcomes. *Science Advances*, *2*(3), e1501422–e1501422.

http://doi.org/10.1126/sciadv.1501422

Desimone, L., & Pak, K. (2017). Instructional coaching as high-quality professional development. *Theory Into Practice*. Taylor & Francis. http://doi.org/10.1080/00405841.2016.1241947

Dickson, K., Hughes, K., & Stephens, B. (2016). Outsourcing academic development in higher education: Staff perceptions of an international program. *International Journal for Academic Development*, *1324*(January), 1–14. http://doi.org/10.1080/1360144X.2016.1218884

Donovan, D., Borda, E., Hanley, D., & Landel, C. (2015). Participation in a multi-institutional curriculum development project changed science faculty knowledge and beliefs about teaching science. *Journal of Science Teacher Education*, *26*(2), 193–216. http://doi.org/10.1007/s10972-014-9414-z

Ebert-May, D., Derting, T., Henkel, T., Maher, J., Momsen, J., Arnold, B., & Passmore, H. (2015). Breaking the cycle: Future faculty begin teaching with learner-centered strategies after professional development. *CBE Life Sciences Education*, *14*(2), 1–12. http://doi.org/10.1187/cbe.14-12-0222

Ebert-May, D., Derting, T., Hodder, J., Momsen, J., Long, T., & Jardeleza, S. (2011). What we say is not what we do: Effective evaluation of faculty professional development programs. *BioScience*, *61*(7), 550–558. http://doi.org/10.1525/bio.2011.61.7.9

Elliott, E., Reason, R., Coffman, C., Gangloff, E., Raker, J., Powell-Coffman, J., & Ogilvie, C. (2016). Improved student learning through a faculty learning

community: How faculty collaboration transformed a large-enrollment course from lecture to student centered. *CBE Life Sciences Education*, *15*(2), 1–14. http://doi.org/10.1187/cbe.14-07-0112

Ertmer, P., Gopalakrishnan, S., & Ross, E. (2001). Technology-using teachers. *Journal Of Research On Computing In Education*, *33*(5), 1–26.

Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, *53*(4), 25–39. http://doi.org/10.1007/BF02504683

Ertmer, P., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, *59*(2), 423–435. http://doi.org/10.1016/j.compedu.2012.02.001

Ertmer, P., Ottenbriet-Leftwich, A., & Tondeur, T. (2015). Teachers' beliefs and uses of technology to support 21st-century teaching and learning. In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 403–418). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Ertmer, P., Paul, A., Molly, L., Eva, R., & Denise, W. (2014). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of Research on Computing in Education*, *32*(1), 54–72. http://doi.org/10.1080/08886504.1999.10782269

Faulkner, C. (2015). *Exploring the relationships between faculty beliefs and technology*

preferences. University of North Texas.

Fives, H., Lacatena, N., & Gerard, L. (2015). Teachers' beliefs about teaching (and learning). In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 249–265). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Redacted, (2016a)

Garson, K., Bourassa, E., & Odgers, T. (2016). Interculturalising the curriculum: Faculty professional development. *Intercultural Education*, *27*(5), 457–473. http://doi.org/10.1080/14675986.2016.1240506

Gill, M., & Hardin, C. (2015). A "hot" mess: Unpacking the relation between teacher's beliefs and emotions. In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 230–245). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Guinea, A., & Markus, L. (2009). Why break the habit of a lifetime? Rethinking the roles of intention, habit, and emotion in continuing information technology use. *MIS Quarterly*, *33*(3), 433–444.

Hassan, S. (2013). An analysis of perceptions of academics regarding the reward for excellence in teaching versus the reward for excellence in research: critical theory approach. *Alternation*, (9), 292–317. Retrieved from http://alternation.ukzn.ac.za/

Hellmann, J. H., Paus, E., & Jucks, R. (2014). How can innovative teaching be taught? Insights from higher education. *Psychology Learning and Teaching*, *13*(1), 43–51. http://doi.org/10.2304/plat.2014.13.1.43

Herckis, L. (2018). Cultivating practice: Ensuring continuity, acknowledging change. *Practicing Anthropology*, *40*(1), 43–47. http://doi.org/https://doi.org/10.17730/0888-4552.40.1.43

Hoffman, B., & Seidel, K. (2015). Measuring teachers' beliefs: For what purpose? In M. Fives, H.; Gill (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 106–127). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Holdsworth, S., & Thomas, I. (2015). A sustainability education academic development framework (SEAD). *Environmental Education Research*, *22*(April), 1073–1097. http://doi.org/10.1080/13504622.2015.1029876

Hou, S., & Wilder, S. (2015). How ready is higher education faculty for engaged student learning? Applying transtheoretical model to measure service-learning beliefs and adoption. *SAGE Open*, *5*(1). http://doi.org/10.1177/2158244015572282

Hsu, P. (2016). Examining current beliefs, practices and barriers about technology integration: A case study. *TechTrends*, *60*(1), 30–40. http://doi.org/10.1007/s11528-015-0014-3

Hussain, M. (2017). Internet of things: Challenges and research opportunities. *CSI Transactions on ICT*, *5*(1), 87–95. http://doi.org/10.1007/s40012-016-0136-6

Husserl, E. (1931). *Ideas: General introduction to pure phenomenology* (1st ed.). London and New York: Routledge.

Jaipal-Jamani, K., Figg, C., Gallagher, T., Scott, R., & Ciampa, K. (2015). Collaborative professional development in higher education : Developing knowledge of

technology enhanced teaching. *The Journal of Effective Teaching*, *15*(2), 30–44.

Jamalzadeh, M., & Shahsavar, Z. (2015). The effects of contextual factors on teacher's beliefs and practices. *Procedia - Social and Behavioral Sciences*, *192*, 166–171. http://doi.org/10.1016/j.sbspro.2015.06.024

Jawitz, J., & Perez, T. (2015). Investing in teaching development: Navigating risk in a research intensive institution. *International Journal for Academic Development*, *1324*(June), 1–12. http://doi.org/10.1080/1360144X.2015.1081852

Jawitz, J., & Perez, T. (2016). Asserting agency : Navigating time and space for teaching development. *South African Journal of Higher Education*, *30*(6), 112–126. http://doi.org/http://dx.doi.org/10.20853/30-6-722

Jazaieri, H., McGonigal, K., Jinpa, T., Doty, J., Gross, J., & Goldin, P. (2014). A randomized controlled trial of compassion cultivation training: Effects on mindfulness, affect, and emotion regulation. *Motivation and Emotion*, *38*(1), 23–35. http://doi.org/10.1007/s11031-013-9368-z

Kane, R., Sandretto, S., & Heath, C. (2002). Telling half the story: A critical review of research on the teaching beliefs and practices of university academics. *Review of Educational Research*, *72*(2), 177–228. http://doi.org/10.3102/00346543072002177

Kennedy, M. (2016). How does professional development improve teaching? *Review of Educational Research*, *20*(10), 1–36. http://doi.org/10.3102/0034654315626800

Kenrick, D. (2017). Self-actualization, human nature, and global social problems. *Society*, *54*(6), 520–523. http://doi.org/10.1007/s12115-017-0181-2

Kim, C., Kim, M., Lee, C., Spector, J., & DeMeester, K. (2013). Teacher beliefs and

technology integration. *Teaching and Teacher Education*, *29*, 76–85. http://doi.org/10.1016/j.tate.2012.08.005

Kopcha, T., Rieber, L., & Walker, B. (2015). Understanding university faculty perceptions about innovation in teaching and technology. *British Journal of Educational Technology*, *47*(5), 945–957. http://doi.org/10.1111/bjet.12361

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management*, *40*(3), 191–204. http://doi.org/10.1016/S0378-7206(01)00143-4

Leigh, J. (2016). An embodied perspective on judgements of written reflective practice for professional development in Higher Education. *Reflective Practice*, *17*(1), 72–85. http://doi.org/10.1080/14623943.2015.1123688

Levin, B. (2015). The development of teachers' beliefs. In H. Fives, M.; Gill (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 48–65). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Lucilio, L. (2009). What secondary teachers need in professional development. *Catholic Education: A Journal of Inquiry & Practice*, *13*(1), 53–75. Retrieved from http://wf2dnvr9.webfeat.org/erm9N1467/url=http://web.ebscohost.com/ehost/detail?vid=1&hid=107&sid=93a3dd9a-d614-49a2-af19-973ed907d2ea%40sessionmgr111&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#db=ehh&AN=44150235

Lunn, J., Walker, S., & Mascadri, J. (2015). Personal epistemologies and teaching. In H. Fives, M.; Gill (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp.

319–335). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Redacted, (2013a).

Mazur, E. (2015). A morning with Mazur: Confessions of a converted lecturer. In *A Morning with Mazur: Confessions of a Converted Lecturer*. Retracted.

McConnell, T., Parker, J., Eberhardt, J., Koehler, M., & Lundeberg, M. (2013). Virtual professional learning communities: Teachers' perceptions of virtual versus face-to-face professional development. *Journal of Science Education and Technology*, *22*(3), 267–277. https://doi.org/10.1007/s10956-012-9391-y

McKenna, S., & Boughey, C. (2014). Argumentative and trustworthy scholars: the construction of academic staff at research-intensive universities. *Teaching in Higher Education*, *19*(July), 825–834. http://doi.org/10.1080/13562517.2014.934351

Merriam, S. (1998). *Qualitative research and case study applications in education* (2nd ed.). San Francisco, CA: Jossey-Bass Education.

Merriam, S., & Tisdell, E. (2015). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.

Moustakas, C. (1994). *Phenomenological research methods* (1st ed.). Thousand Oaks: Sage Publications.

Nicholls, G. (2001). *Professional development in higher education: New dimensions & directions.* London, UK: Kogan Page.

Nygaard, L. (2017). Studies in higher education publishing and perishing : An academic literacies framework for investigating research productivity. *Studies in Higher*

Education, *5079*(June). http://doi.org/10.1080/03075079.2015.1058351

Oko, T. (1992). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. *Teachers College Press* (4th ed., Vol. 37). New York and London: Teachers College Press. http://doi.org/10.1037/032390

Olmstead, A. (2016). *An assessment of professional development for astronomy and physics faculty : Expanding our vision of how to support faculty's learning about teaching*. (Doctoral dissertation).

Olmstead, A., & Turpen, C. (2016). Assessing the interactivity and prescriptiveness of faculty professional development workshops: The real-time professional development observation tool. *Physical Review Special Topics - Physics Education Research*, *12*(2), 1–30. http://doi.org/10.1103/PhysRevPhysEducRes.12.020136

Ott, M., & Cisneros, J. (2015). Understanding the changing faculty workforce in higher education: A comparison of full-time non-tenure track and tenure line experiences. *Education Policy Analysis Archives*, *23*(90), 1–28. http://doi.org/10.14507/epaa.v23.1934

Overbaugh, R., & Lu, R. (2009). The impact of a federally funded grant on a professional development program: Teachers' stages of concern toward technology integration. *Journal of Computing in Teacher Education*, *25*(2), 45–55. Retrieved from www.iste.org

Ozer, E., & Akgun, O. (2015). The effects of irrational beliefs on academic motivation and academic self-efficacy of candidate teachers of computer and instructional technologies education department. *Procedia - Social and Behavioral Sciences*, *197*,

1287–1292. http://doi.org/10.1016/j.sbspro.2015.07.401

Padilla-Díaz, M. (2015). Phenomenology in educational qualitative research: Philosophy as science or philosophical science? *International Journal of Educational Excellence*, *1*(2), 101–110. http://doi.org/10.18562/IJEE.2015.0009

Pine-Thomas, J. (2017). *Educator's technology integration barriers and student technology preparedness as 21st century professionals*. (Doctoral dissertation). Retrieved from http://search.proquest.com

Pomeroy, W. (2014). *Academic analytics in higher education: Barriers to adoption*. (Doctoral dissertation). Retrieved from http://search.proquest.com

Redacted, (2017a).

Redacted, (2017b).

Reid, P. (2014). Categories for barriers to adoption of instructional technologies. *Education and Information Technologies*, *19*(2), 383–407. http://doi.org/10.1007/s10639-012-9222-z

Redacted, (2013b).

Rogers, E. (2003). *Diffusion of innovation* (5th ed.). New York, NY: Free Press.

Roxå, T., & Mårtensson, K. (2016). Agency and structure in academic development practices: Are we liberating academic teachers or are we part of a machinery supressing them? *International Journal for Academic Development*, *1324*(January), 1–11. http://doi.org/10.1080/1360144X.2016.1218883

Rubie-Davies, C. (2015). Teachers' instructional beliefs and the classroom climate. In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp.

266–283). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Sadaf, A., Newby, T., & Ertmer, P. (2016). An investigation of the factors that influence preservice teachers' intentions and integration of Web 2.0 tools. *Educational Technology Research and Development*, *64*(1), 37–64. http://doi.org/10.1007/s11423-015-9410-9

Sahin, I. (2006). Detailed review of Rogers' diffusion of innovations theory and educational technology: Related studies based on Rogers' theory. *The Turkish Online Journal of Educational Technology*, *5*(2), 14–23.

Saldana, J. (2016). *The coding manual for qualitative reseachers*. (J. Seaman, Ed.) (3rd ed.). Los Angeles, CA: Sage Publications.

Salleh, S. (2016). Examining the influence of teachers' beliefs towards technology integration in classroom. *International Journal of Information and Learning Technology*, *33*(1), 17–35. http://doi.org/10.1108/IJILT-10-2015-0032

Seidman, I. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (4th ed.). New York and London: Teachers College Press.

Singh, G., & Hardaker, G. (2014). Barriers and enablers to adoption and diffusion of eLearning: A systematic review of the literature – a need for an integrative approach. *Education + Training*, *56*(2), 105–121. http://doi.org/10.1108/ET-11-2012-0123

Singh, V., & Mayer, P. (2014). Scientific writing: Strategies and tools for students and

advisors. *Biochemistry and Molecular Biology Education*, *42*(5), 405–413. http://doi.org/10.1002/bmb.20815

Siwatu, K., & Chesnut, S. (2015). The career development of preservice and inservice teachers: Why teachers' self-efficacy beliefs matter. In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 212–229). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Skott, J. (2015). The promises, problems, and prospects of research on teachers' beliefs. In M. Fives, H.; Gill (Ed.), *International Handbook of Research on Teachers' Beliefs* (First, pp. 13–30). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Smith, K. (2012). Lessons learnt from literature on the diffusion of innovative learning and teaching practices in higher education. *Innovations in Education and Teaching International, 49*(August 2015), 173–182. http://doi.org/10.1080/14703297.2012.677599

Stupnisky, R., Hall, N., Daniels, L., & Mensah, E. (2017). Testing a model of pretenure faculty members' teaching and research success: Motivation as a mediator of balance, expectations, and collegiality. *The Journal of Higher Education (In Press)*, *00*(00), 1–25. http://doi.org/10.1080/00221546.2016.1272317

Teo, T., & Zhou, M. (2016). The influence of teachers' conceptions of teaching and learning on their technology acceptance. *Interactive Learning Environments*, *4820*(March), 1–15. http://doi.org/10.1080/10494820.2016.1143844

Thomas, S., Chie, Q., Abraham, M., Jalarajan Raj, S., & Beh, L. (2014). A qualitative review of literature on peer review of teaching in higher education: An application of the SWOT framework. *Review of Educational Research*, *84*(March 2014), 112–159. http://doi.org/10.3102/0034654313499617

Tondeur, J., Van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2016). Understanding the relationship between teachers pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development*, *65*(3), 1–21. http://doi.org/10.1007/s11423-016-9481-2

Trede, F., Macklin, R., & Bridges, D. (2012). Professional identity development: a review of the higher education literature. *Studies in Higher Education*, *37*(907396158), 365–384. http://doi.org/10.1080/03075079.2010.521237

Tschannen-Moran, M., Salloum, S., & Goddard, R. (2015). The influence of collective beliefs and shared norms. In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 301–316). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Van Schalkwyk, S., Leibowitz, B., Herman, N., & Farmer, J. (2015). Reflections on professional learning: Choices, context and culture. *Studies in Educational Evaluation*, *46*, 4–10. http://doi.org/10.1016/j.stueduc.2015.03.002

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Cambridge, Massachusetts: Harvard University Press.

Watt, H., & Richardson, P. (2015). A motivational analysis of teachers' beliefs. In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers' Beliefs* (pp. 191–211). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Wurdinger, S., & Allison, P. (2017). Faculty perceptions and use of experiential learning in higher education. *Journal of E-Learning and Knowledge Society*, *13*(1), 15–26. Retrieved from http://www.je-lks.org/ojs/index.php/Je-LKS_EN/article/view/1309/1050

Yeom, Y., Miller, M., & Delp, R. (2018). Constructing a teaching philosophy: Aligning beliefs, theories, and practice. *Teaching and Learning in Nursing*, *13*(3), 131–134. http://doi.org/10.1016/j.teln.2018.01.004

Yuksel, P., & Yildirim, S. (2015). Theoretical frameworks, methods, and procedures for conducting phenomenological studies in educational settings. *Turkish Online Journal of Qualitative Inquiry*, *6*(January), 1–20.

Yurtseven, N., & Bademcioglu, M. (2016). Teachers' professional development: A content analysis about the tendencies in studies. *Journal of Education and Training Studies*, *4*(6), 214–233. http://doi.org/10.11114/jets.v4i6.1475

Yuzhuo, C. (2017). Towards an emerging research field of studies on innovation in higher education : An analytical framework for understanding the innovation process in higher education. *The Review of Higher Education*, *40*(4), 585–616. http://doi.org/10.1353/rhe.2017.0023

Zembylas, M., & Chubbuck, S. (2015). The intersection of identity, beliefs, and politics

in conceptualizing “teacher identity.” In H. Gill, M.; Fives (Ed.), *International Handbook of Research on Teachers’ Beliefs* (pp. 173–190). New York, NY: Taylor & Francis. http://doi.org/http://dx.doi.org/10.4324/9780203108437

Redacted, (2016b).

Appendix A: Round 1 Email Introduction to Prospective Participants

Email Subject: Dissertation Research Interview Request - Professional Development and Change in Instruction

Dear Dr. (Name),

You are invited to participate in a research study to identify if participation in the professional development program (redacted) contributed to changes in your beliefs related to teaching and learning. This anonymous research study seeks to establish best practices in professional development that contribute to change in the classroom. Once these best practices have been identified they will be made available to those to manage and design (redacted).

This study uses the method Irving Seidman describes in "Interviewing as Qualitative Research: A guide for Researchers in Education and the Social Sciences" (2013). A series of three interviews will be conducted with five instructors.

This study is being conducted completely outside of my role at the University and in no way is the University sponsoring any aspect of it.

I hope you find that being a part of this research panel is a rewarding experience and your knowledge and experiences are valued in helping to determine the best way to assist others in promoting effective classroom instruction.

Should you have any questions or comments about anything related to the research, feel free to contact me. To participate, please respond by (date).

Thank you, Bethany Croton, email address, address, phone number