RESEARCH UNIVERSITY FACULTY VIEWS ON PROFESSIONAL DEVELOPMENT OPPORTUNITIES RELATED TO TEACHING: A Q STUDY

by

Si Zhang

(Under the Direction of Lloyd P. Rieber)

ABSTRACT

The growing number of teaching professional development (TPD) programs in most major universities shows higher education institutions' determination to improve the quality of classroom teaching with the support of contemporary instructional strategies and advanced technology. However, TPD programs at research universities often face the struggle of how to engage faculty members to participate in voluntary TPD. This study used a unique mixed-methods methodology named Q methodology to investigate perceptions of faculty members in research universities toward their participation in TPD in order to understand motives for and barriers against faculty members' participation in TPD. Q methodology uses an integrated quantitative and qualitative framework to examine human subjectivity. This study followed Watts and Stenner's (2012) guidance for conducting multi-participants Q research. Discussion of the findings of this study involve comparisons of different viewpoints of faculty members in a large college of education at a research university regarding their participation in TPD.

INDEX WORDS: Q methodology, Q-sorts, teaching professional development, faculty motivation, research university, self-determination theory.

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DEDICATION

To my loving parents, Songqing Zhang and Hong Zeng, for their unconditional love and support over the years.

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CHAPTER 1

INTRODUCTION

Faculty development in higher education often refers to programs and initiatives that aim to enhance teaching and learning as well as support institutional changes (Sorcinelli et al., 2006). It is common for faculty development programs, such as those offered through centers for teaching and learning, to provide consultation and training regarding instructional strategies, curriculum development, teacher/student interactions, career planning, leadership development, discipline policies, and wellness management (Gillespie & Robertson, 2010). In this study, all activities that support faculty members in higher education regard to improving their teaching excellence are defined as *teaching professional development* (TPD).

This study has a focus on TPD activities that support faculty members' integrations of technology in their teaching practices, which I refer to as *technology-based TPD*. Higher education institutions invested in technology integration in teaching from decades ago (Gilbert, 1996; Green, 1996), but the transformation from teacher-centered teaching to technology assisted student-centered teaching was slow (Selwyn, 2016). Therefore, it is significant to include technology as part of the definition of TPD since faculty members in higher education are expected to integrate technology into their teaching.

Moreover, this study focused on faculty members from a large college of education in a research-I university. The college of education offered a technology-based

TPD program named *Innovation in Teaching and Technology* (ITT). Although the scope of the study was not limited to faculty participants in ITT, it is worth noting that the existence of ITT in the college and my work experience with ITT were important parts of the study context.

Challenges and Opportunities

In the past decade, colleges and universities in the U.S. have encountered a series of challenges that have required them to find alternative paths or models for education. For example, college enrollments in the U.S. have declined for the eighth consecutive year as of the 2018-2019 academic year according to the 2020 EDUCAUSE Horizon Report (M. Brown et al., 2020). This statistic reflects a decrease in the public's trust in higher education. One of the reasons that has contributed to the current dilemma in higher education is the public's doubts about the quality of higher education in the context of extremely high costs of tuition (Bastedo et al., 2016; M. Brown et al., 2020). In response to the growing public concern about the quality of higher education, colleges and universities have invested in programs promoting teaching excellence. As of January 2021, 1,281 teaching centers had joined the *Professional and Organizational Development Network in Higher Education* (POD Network), the largest educational development community in North America (POD Network, 2021), compared to 308 in 1978 (North & Scholl, 1979). This increase indicates the importance of faculty development in an attempt to overcome the current challenges faced by higher education as can also be seen in that faculty development remained as one of the top three priorities in terms of postsecondary teaching and learning between 2014 and 2019 (EDUCAUSE, 2019). Past research has echoed this need, calling for faculty development "to respond to

institutional problems and propose constructive solutions as [higher education institutions] meet the challenges of the new century" (Sorcinelli et al., 2006, p. 28).

The missions of TPD should align with the strategic plans of an institution in order to provide a sustainable support for faculty members to overcome institutional challenges. Unfortunately, the quality of TPD programs varies from institution to institution often due to misinterpretations of various TPD missions. Herman (2012) found that course management system (CMS) training (90.4%), followed by technical services (89.0%) were the most common topics covered by TPD for online teaching in higher education. Meyer and Murrell (2014) reported that training on CMS (84.4%), wikis (71.1%), and mobile technologies (62.2%) were the most frequent topics covered by TPD in higher education. Many TPD programs are overly interested in faculty members' technological competence, yet often fail to address the pedagogical rationale of using technology. Thus, many faculty members consider participation in TPD akin to joining a technology training camp instead of learning opportunities for pedagogical reflection and professional growth.

Studies on TPD in higher education have a tradition of evaluating the learning outcomes of faculty members to evaluate the effectiveness of the TPD design (Garet et al., 2001; Hines, 2017; Kenney et al., 2010). However, participation in TPD in higher education, particularly at research universities, is usually on a voluntary basis. Consequently, faculty participation rates, especially sustainable participation rates, in TPD should also be considered when evaluating a program's success. A study showed that public research universities have the lowest faculty participation rates in TPD compared to public four-year colleges, private colleges, and proprietary universities

(Lowenthal et al., 2012). In order to increase faculty members' participation in TPD, it is essential to understand what misinterpretations faculty members hold as well as the motivations for and barriers against faculty members' participation in TPD. Surprisingly, little attention has been given in the current literature to faculty members' motivations to participate in TPD (Bouwma-Gearhart, 2012).

Professional development for K12 teachers shares commonalities with TPD in higher education. As such, the lessons learned in research related to the professional development of K12 teachers could benefit the development of TPD in higher education. However, it is worth noting that higher education institutions, particularly research universities, have unique institutional cultures. Unlike K12 teachers, teaching is not the sole responsibility for faculty members at research universities. The conflicts between research and teaching in the faculty members' daily agendas are well-documented in the literature (Alpay & Jones, 2011; Anderson & Slade, 2016; Miller et al., 2011; Robert & Carlsen, 2017). Under the culture of "publish or perish," faculty members at research universities usually prioritize research over other responsibilities. Therefore, faculty members at research universities often lack the motivation to participate in TPD that promises limited contributions to their research productivity. Thus, it is logical to conclude that faculty members at research universities give little priority to participation in TPD.

Studies have shown that K12 teachers have resisted adopting innovations in teaching because of their negative pedagogical beliefs about technology (Ertmer et al., 2012; Kopcha, 2012; Ottenbreit-Leftwich et al., 2010; Tabata & Johnsrud, 2008). Teachers who applied a behavioral pedagogy in practice were more likely to use

technology as a supplemental tool for the instruction instead of incorporating technology into the curriculum to create student-centered learning (Hooper & Rieber, 1995). Some teachers have even used technology merely as a classroom reward when students have completed a task.

Similar discussions about faculty members in higher education resisting technology adoption in teaching are well-documented in the literature (R. Baldwin, 1998; Belland, 2009; Blin & Munro, 2008; Ertmer, 2005; Ertmer & Ottenbreit-Leftwich, 2010; Flavin, 2012). In higher education, faculty members' resistance to change is even more complicated than the resistance of K12 teachers. For example, the resistance of faculty members in higher education includes, but is not limited to, fear of losing control of materials and teaching style, lack of infrastructural support related to technology integration, concerns about the effectiveness of the implementation, and feelings of isolation in the adoption process (McBride, 2010). Their resistance is also associated with a "lack of compensation for curriculum development as well as [a] lack of recognition for embracing new technological pedagogies in tenure and promotion decisions" (Johnson et al., 2012, p. 63). Therefore, it is vital to convince faculty members at research universities that integrating technology in teaching could enhance interactivity, efficiency, engagement, and productivity in teaching and learning.

Purpose Statement and Research Questions

TPD programs can only achieve their missions when faculty members are motivated to volunteer and participate. In order to encourage faculty members at research universities to participate in TPD and, more importantly, continuously invest in their professional growth, it is critical to understand the perceptions of the faculty members

who work in these institutions with unique, research-driven cultures toward their participation in TPD. As such, further investigation is needed to identify the motives for and barriers against faculty members' participation in TPD within the context of research-driven institutions. Therefore, the purpose of this study was to investigate the perceptions of faculty members at a large college of education (COE) about their participation in technology-based teaching professional development (TPD). The research questions that guided this study were:

1. What are the perceptions of faculty members at research universities toward voluntary, technology-based TPD programs?
2. What motivated faculty members at research universities to participate in voluntary, technology-based TPD programs?
3. What prevented faculty members at research universities from participating in voluntary, technology-based TPD programs?

The self-determination theory guided the analysis of the faculty members' motivations for their participation in TPD using a phenomenological lens. In addition, a unique, mixed-methods design, Q methodology, was used to capture the subjective views that were held by the faculty members in the study in order to provide a holistic understanding of the phenomenon. Table 1.1 presents a brief overview of the data sources and analysis methods that were used to examine and respond to each of the study's research questions.

Theoretical Framework

It is challenging to control or measure human motivations in a traditional positivist manner because of the number of variables that could be involved in the

process. Developed by Deci and Ryan (1985a), the self-determination theory (SDT) is a macro-theory that examines human motivation and personality as used in social contexts. Rather than focusing on quantifying the amount of motivation in a controlled situation, the SDT is interested in identifying the sources of motivations in an intricate social environment as well as the social conditions that enhance or reduce those motivations (Deci & Ryan, 2008; Ryan & Deci, 2017).

In general, SDT categorizes human motivation into three types: autonomous motivation, controlled motivation, and amotivation (Deci & Ryan, 1985a). Autonomous motivation is often a combination of intrinsic motivation and certain extrinsic motivations that are associated with self-actualization (Ryan & Deci, 2000a), which, in turn, motivate individuals to be self-regulated and enhance individuals' performances. Empirical studies using SDT as their framework have shown that, when learners are autonomously motivated, they perform more effectively and maintain greater psychological health (Deci & Ryan, 2008). Therefore, autonomous motivation has long been the focus of motivation studies.

In contrast, controlled motivation means that people perform or behave in certain ways under external pressures or due to external causes (Deci & Ryan, 2008). Ryan and Deci (2017) critiqued a common misbelief that controlled motivation has less value than autonomous motivation. It is evident that activities in our daily lives are not always interesting. In fact, SDT studies have shown that controlled motivation can greatly affect individuals' behaviors under certain social conditions (Marinak & Gambrell, 2008; Ryan & Deci, 2000b). It is also normal to have multiple types of motivation in play when an individual is motivated to act (Ryan & Deci, 2017). Thus, SDT is a robust theoretical

framework that covers the analysis of both autonomous and controlled motivation when investigating faculty members at research universities.

From an SDT perspective, it is presumed that faculty members at research universities could be motivated to participate in TPD for several reasons: a) autonomous motivation generated from faculty members' personal interests in TPD; b) controlled motivation produced by faculty members' needs for networking during participation in TPD; and c) controlled motivation generated by external pressures to participate in TPD.

O'Sullivan and Irby (2011) conceptualized an optimal TPD design in order to guide future TPD studies to focus on both the faculty development community and faculty members' workplace community (see Figure 1.1). Past TPD studies have often been limited to activities and actions that happened during TPD. As such, few studies have investigated long-term effects of TPD on faculty members' behaviors after the TPD sessions ended (Rutz et al., 2012; Whitelaw et al., 2004). O'Sullivan and Irby (2011) argued that learning not only happened during the faculty members' participation in TPD, but also in their work environments, so the effectiveness of a TPD program has to be evaluated in the larger context of the faculty members' workplace. According to O'Sullivan and Irby (2011), each component within the faculty development community ties to a key component within the workplace community.

In summary, activities that take place in the faculty development community are always affected by the broad context of the faculty members' workplace. O'Sullivan and Irby (2011) stressed the importance of considering how social contexts influence TPD design, while Ryan and Deci (2017) concentrated on social conditions that could enhance or reduce motivation. As the two theories share a focus on the social environment, their

combined use allows researchers to study motivation in a TPD context and investigate TPD design from a phenomenological perspective. Thus, the SDT theory and O'Sullivan and Irby's (2011) TPD model offer coherent guides for the research framework of this study. Figure 1.2 illustrates a preliminary understanding of the factors that could influence faculty members' participation in TPD at research universities based on a 2016 exploratory study (see Chapter 3).

Significance of the Study

The importance of faculty development in supporting faculty members' career success can be traced to Harvard University in 1810 (Ouellett, 2010). Not surprisingly, the original focus of faculty development in higher education was research expertise (Sorcinelli et al., 2006), which is still an important goal of many faculty development programs today. Later, faculty members in higher education started to reflect on the practice of perceiving research as the sole benchmark of faculty achievement and called for a diversified scholarship that included the *scholarship of teaching and learning* (Boyer, 1990). After the mid-1960s, the focus of faculty development leaned towards the improvement of teaching effectiveness and led to the emergence of TPD activities (Ouellett, 2010). The founding of the POD Network in 1976 marked a further emphasis on faculty development (Ouellett, 2010). It was at that time that faculty members started to consider faculty development to consist of lifelong, holistic, personal, and professional growth.

The findings of K12 studies have shown strong support for technology integration in teaching and learning (Kposowa & Valdez, 2013; Lei & Zhao, 2007; Shapley et al., 2011; Tamim et al., 2011). Meanwhile, the growing demand for online education has also

motivated colleges and universities to focus on and invest in technology (Dahlstrom, 2015). As a result, many TPD programs have invested a significant number of resources and effort in technical trainings for faculty members.

However, TPD programs should also prepare faculty members with the skills necessary to adapt to the changes in the modern higher education environment that require more than technological competence. For instance, TPD needs to bridge teaching practices with evidence-based strategies and provide sustainable learning opportunities to faculty members at different career stages (Austin & Sorcinelli, 2013). TPD needs to introduce leading-edge educational technologies for instructional purposes (Austin & Sorcinelli, 2013) and needs to develop communities of practice and encourage interdisciplinary collaborations (O'Sullivan & Irby, 2011). Yet, regardless of what types of missions a TPD program might have, the programs face a historical challenge that has been discussed for a decade—if we build it, will they come? (Padgett & Conceição-Runlee, 2000; Taylor & McQuiggan, 2008). TPD can only act as an agent of change to support institutions in response to the public's demands for higher education if the majority of the faculty members in higher education are constantly engaged in TPD. This study represents a thorough investigation of the perceptions and motivations of faculty members at research universities about their participation in TPD in order to assist stakeholders, including faculty members, administrators, and TPD leaders, at research universities to achieve a holistic understanding of faculty members' needs and concerns in terms of technology-based TPD.

Table 1.1

Research Questions, Data Sources, and Analyses

Research Question	Data Sources	Analyses
1. What are the perceptions of faculty members at research universities toward voluntary TPD programs that focus on teaching with technology?	Pre-sorting online survey; Q-sorts; After-sorting questionnaire; Semi-structured interviews.	Descriptive statistics (Trochim et al., 2016); Q factor analysis (Brown, 1980); Crib sheet technique (Watts & Stenner, 2012).
2. What motivated faculty members at research universities to participate in voluntary TPD programs that focus on teaching with technology?	Q-sorts; Semi-structured interviews; Researcher's notes.	Self-determination theory (Ryan & Deci, 2017); Thematic analysis (Saldaña, 2016).
3. What prevented faculty members at research universities from participating in voluntary TPD programs that focus on teaching with technology?	Q-sorts; Semi-structured interviews; Researcher's notes.	Self-determination theory (Ryan & Deci, 2017); Thematic analysis (Saldaña, 2016).

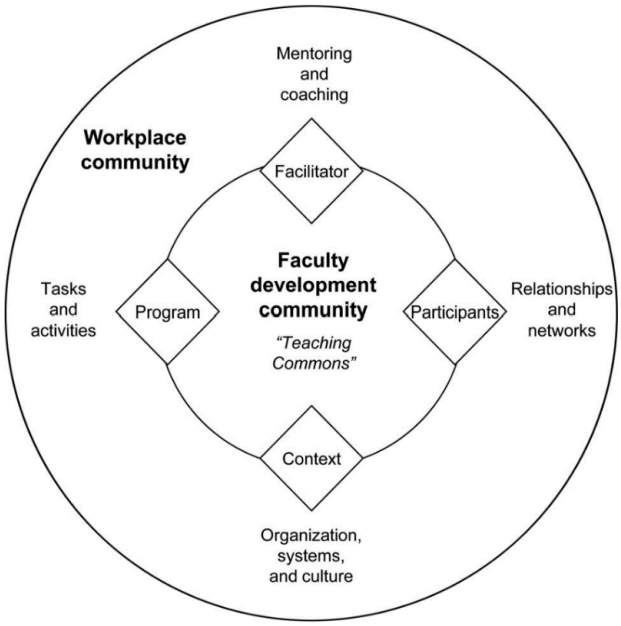


Figure 1.1 *Faculty development model. Retrieved from "Reframing research on faculty development," by P. O'Sullivan, and D. Irby, 2011, Academic Medicine, 86(4), p. 424.*

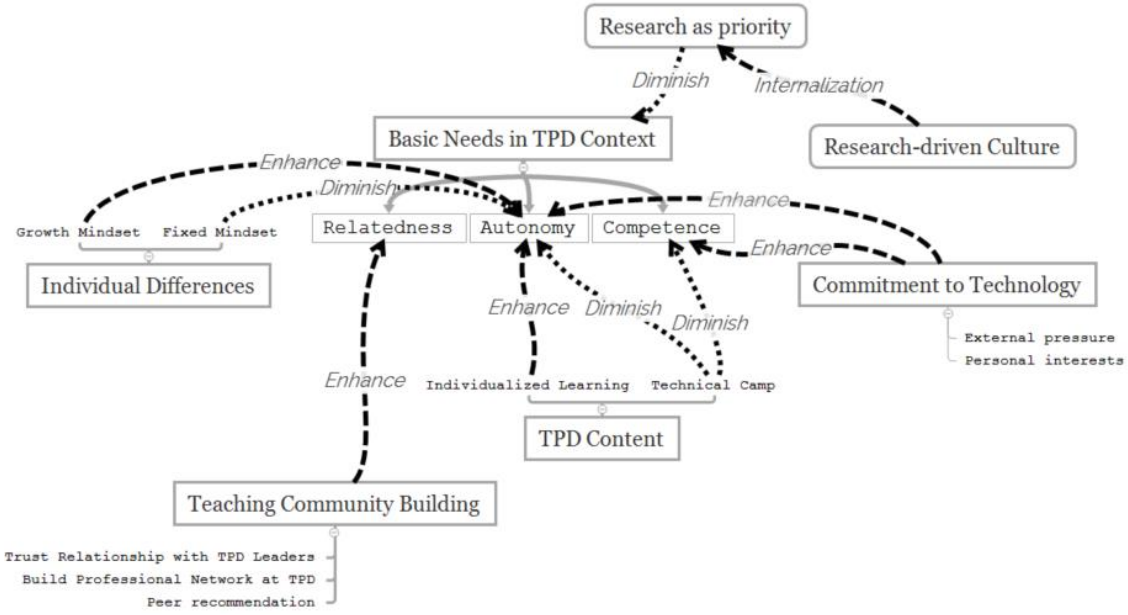


Figure 1.2 *SDT in the context of teaching professional development (TPD)*

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this study is to investigate the perceptions of the faculty members at a large college of education (COE) toward their participation in technology-based teaching professional development (TPD). The study also examines what factors are identified by faculty members at research universities as motives for and barriers against their participation in TPD. This chapter reviews relevant literature on faculty members' motivations in various contexts and challenges for TPD in higher education. This review of the literature begins with a discussion related to using the self-determination theory (SDT) as a guiding theoretical framework to examine faculty members' motivations. Then, a brief history of TPD in higher education is presented. Empirical studies related to TPD in higher education are reviewed to contextualize the study within the existing literature.

To identify the gaps in the literature, a search was conducted in the Web of Science, ERIC, and PsycINFO databases. Combinations of the search terms "self-determination theory," "faculty motivation," "teaching," "professional development," "faculty development," and "higher education" were used to identify peer-reviewed articles between 2010 and 2020. The intention of these searches was to obtain an overview of previous research that examined faculty members' motivations related to using the SDT and TPD in higher education in the U.S. Preference was then given to more recent studies focused on full-time faculty members in higher education. Some

classic studies regarding faculty members at research universities were added to this review to present the unique culture of research universities. After reading the abstracts and articles listed in the search result, a final set of 25 articles was selected to be used to review two issues: 1) using the SDT to investigate faculty members' motivation and 2) TPD in higher education.

Self-Determination Theory

The self-determination theory (SDT) was developed on the foundation of research on intrinsic and extrinsic motivation (Deci & Ryan, 1985a, 1985b; Ryan et al., 1985). Ryan and Deci (2017) defined SDT as "an empirically based, organismic theory of human behavior and personality development" (p. 13). SDT has roots in psychological studies and has deliberately embraced empirical methods for theory development (Ryan & Deci, 2017). It emphasizes "explicit hypotheses, operational definitions, observational methods, and statistical inferences, as central and meaningful to its epistemological strategy" (Ryan & Deci, 2017, p. 15). SDT has been used in a wide variety of empirical studies across a range of applied fields, such as education (Dyrberg & Holmegaard, 2019), health care (Williams et al., 2006), and management (Grant & Shin, 2012). According to SDT, human beings are "inherently curious, physically active, and deeply social beings" (Ryan & Deci, 2017, p. 14). Thus, SDT posits that human development involves behavioral regulations within social environments and focuses on sources of motivation in social contexts rather than the amount of motivation that guides human actions.

Autonomy, Competence, and Relatedness

Building on the findings of these empirical studies, SDT claims that human beings pursue satisfactions based on three basic psychological needs, autonomy, competence, and relatedness, when entering a social environment (Deci & Ryan, 2000). Past SDT studies have shown that these needs can be used as predictors of autonomous motivation in social contexts (Ryan & Deci, 2017). According to SDT, *autonomy* refers to "the regulation of behavior by the self" (Ryan & Deci, 2017, p. 122). High autonomy predicts high-quality learning and creativity for individual performance (Deci & Ryan, 1985a; Ryan & Deci, 2000a). Thus, an autonomous motivation is often the most ideal condition for an individual's behavior in motivation studies.

Another basic psychological need for well-being is *competence*, which refers to the intrinsic satisfaction that is produced when one has an impact on their internal or external environment (Deci & Ryan, 1985a; Ryan & Deci, 2017). An individual's development of competence relates to their ownership of the activity and the environment (Deci & Ryan, 1985a). When an individual interprets their actions as being controlled, the perceived impact of their actions on the environment is low. Therefore, the individual's need for competence is rejected. SDT defines a competent activity as autonomously initiated or endorsed (Ryan & Deci, 2017).

Humans, as social beings, demand a feeling of belonging in a social environment. As such, it is important for human beings to feel respected and valued by others in the same social context. Deci and Ryan (2000) asserted that the need for *relatedness* is key to understanding the internalization of external values and cultures. People usually conduct themselves in ways that they believe conform to social norms when building meaningful

connections with others. For example, children follow their parents' directions so as to behave in the expect social norms of a family due to the close bond of the two parties. However, when the social acceptance by others is conditional, the need for relatedness may not be fulfilled (Ryan & Deci, 2017). In other words, people have to personally acknowledge and affirm their actions to satisfy their need for relatedness. For instance, when a child perceives that their parents' love is based on their academic excellence at school, then their need for relatedness is not satisfied even if they perform well in school. However, when a child perceives that their parents' love is unconditional and that achieving academic excellence will strengthen the family bond, then their need for relatedness will be fulfilled when they perform well at school. The differences between the two example social contexts may be nuanced but may cause significant impact on the two children's motivation.

An Autonomy-Control Continuum

SDT proposes an *autonomy-control continuum* of motivation that could be subdivided into different regulatory styles depending on the *perceived locus of causality* (PLOC) of the action (Deci & Ryan, 1985b). PLOC was first introduced in Heider's (1958) work, where he argued that an individual's interpretation of themselves and others in a social context determine their subsequent behaviors. deCharms (1981) then extended the concept by explaining the internal and external PLOC. With an internal PLOC, an individual perceives themselves as the reason for the action or behavior, while with an external PLOC, an individual experiences external pressures or forces to act (Ryan & Deci, 2017). Based on the PLOC, SDT presents an autonomy-control continuum that categories motivation into: amotivation, external regulation, introjection regulation,

identified regulation, integration regulation, and intrinsic motivation (Deci & Ryan, 1985b; Ryan & Deci, 2000a) (see Figure 2.1). To be more specific, when the PLOC of an action is impersonal, the individual would have no intention or being *amotivation* to perform the action. *Amotivation* presents the state of individuals when they feel a lack of competence to perform the action, or when they do not find any relevance of the action to fulfill their psychological needs, or when they purposefully demonstrate a resistance to the external social influence (Ryan & Deci, 2017).

In contrast, when an individual has an internal PLOC for an activity, they will autonomously engage in the activity with *intrinsic motivation* (Ryan & Deci, 2000a). Intrinsic motivation is associated with the highest level of autonomous motivation and refers to behaviors "for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000a, p. 56). Autonomous motivation is often the focus of motivation studies due to its significant value for enhancing cognitive engagement and performance quality (Sanford, 1976). SDT asserts that autonomous motivation is "an evolved and inherent propensity" (Ryan & Deci, 2017, p. 154) for each individual as it cannot be caused or created by external conditions. However, social-contextual factors can enhance or undermine autonomous motivation, which is a focus of SDT.

In between the two extremes of the autonomy continuum, individuals might have an external PLOC for the activity but still present somewhat autonomous motivation, which is called *extrinsic motivation* (Ryan & Deci, 2017). In contrast to intrinsic motivation, the value of extrinsic motivation is often underestimated due to the external PLOC of the action. Some motivation theories consider extrinsic motivation as non-autonomous and having only "instrumental value" (Ryan & Deci, 2000a, p. 60).

However, past SDT studies have shown that extrinsic motivation is not a pale form of motivation as it is often portrayed in older literature (Ryan & Deci, 2017). Instead, extrinsic motivation can greatly vary and can "represent active, agentic states [of motivation]" (Ryan & Deci, 2000a, p. 55). According to SDT, extrinsic motivation is a broad term that covers four regulatory styles: *external regulation*, *introjection regulation*, *identified regulation*, and *integrated regulation* (see Figure 2.1).

External regulation refers to motivation that is often caused by external demands, such as represents the form of extrinsic motivation with the lowest level of autonomy and is often caused by external demands (Ryan & Deci, 2000a). For example, if a university requires that all faculty members to attend a professional development event, then the faculty members will perceive the participation as externally caused. Thus, the faculty members will have the least amount of autonomy for the event.

With introjection regulation, individuals often act for external approval and contingent self-esteem (Deci & Ryan, 1985b). Although individuals may experience internal regulation at this stage, introjection regulation is still quite controlling. The individual's goal in regard to undertaking these actions is often to avoid feelings of guilt or anxiety. For instance, if a faculty member noticed that all of the other faculty members in the department were participating in a professional development event, then this faculty member will likely participate in the event to attain contingent self-esteem from their peers.

Identified regulation is a more autonomous form of extrinsic motivation, which means that the individual experiencing the regulation has identified the value of the regulation or behavior (Ryan & Deci, 2000a). At this stage, the individual can often

connects the regulations or behaviors to their personal goals. For example, if a faculty member perceives professional development as relevant to their tenure or annual evaluation, then the value of the professional development will be identified as pertinent to those career goals.

As a result of fully internalized regulation, integrated regulation is most similar to intrinsic motivation. Although Ryan and Deci (2017) claimed that integrated regulation could not transfer to autonomous motivation, individuals with integrated regulation can be motivated as much as individuals with intrinsic motivation. For example, faculty members with integrated regulation will have fully internalized the culture of the university or their departments into their own beliefs. Therefore, if the external culture promotes TPD, then the faculty member will be highly motivated to attend and participate in TPD. However, faculty members who have intrinsic motivation for TPD would likely be interested in TPD because it provides opportunities for them to learn. That is, they would likely participate in TPD even when the university culture does not recognize the value of their participation. Therefore, intrinsic motivation is the most autonomous motivation.

Using SDT as A Framework

A final set of 11 articles that used SDT as the framework by which to investigate faculty members' motivations was identified. The reviewed studies focused on the fundamental constructs of SDT, including the three basic psychological needs (autonomy, competence, and relatedness), intrinsic/autonomous motivation, and extrinsic/internalized motivation. Most of the studies covered multiple constructs of SDT. Table 2.1 shows a summary of the reviewed studies. The review revealed and identified three themes

regarding faculty motivation from a SDT perspective. The three themes then informed the interpretation of the data for this study.

Significance of a Supporting Environment

SDT identifies *autonomy*, *competence*, and *relatedness* as the three basic psychological needs for well-being (Deci & Ryan, 1985a; Ryan & Deci, 2017) and hypothesizes that external social contexts act on these three psychological needs to enhance or diminish autonomous motivations (Ryan & Deci, 2017). To be more specific, when the social context supports all three psychological needs, individuals will be more self-determined and have a higher degree of autonomous motivation. In contrast, if individuals cannot fulfill their psychological needs within the social context, then their autonomous motivation will be diminished.

Previous studies have shown that a supportive social environment is necessary to satisfy faculty members' psychological needs for *autonomy*, *competence*, and *relatedness*. For example, Stupnisky et al. (2017) hypothesized that a supportive social environment that includes work-life balance, professional balance, clear expectations, and collegiality satisfy untenured faculty members' psychological needs for *autonomy*, *competence*, and *relatedness*. In a study by Stupnisky et al. (2017), an SDT model was proposed to predict untenured faculty members' psychological needs in relation to their successes in teaching and research. A total of 105 faculty members from two public research universities were surveyed in order to assess their self-perceptions about personal balance, professional balance, clear expectations, and collegiality, which are the four key aspects for evaluating the social environment for untenured faculty members

(Stupnisky et al., 2017). Faculty members were also requested to self-evaluate their satisfaction levels regarding the three basic psychological needs.

Stupnisky et al. (2017) reported that the social environment strongly and positively correlated to the faculty members' satisfaction with the three psychological needs, which, in turn, predicted the faculty members' performances in research and teaching. However, the findings indicated that the social factor that had the most significant positive correlation with the three psychological needs was not the same one in the teaching and research domain (Stupnisky et al., 2017). In the teaching domain, *relatedness* and *autonomy* were largely positive correlated with the social environment factor of collegiality. Not surprisingly, *relatedness* was the only SDT variable that significantly predicted intrinsic motivation for teaching. The results indicated that untenured faculty members demanded collegial support to achieve teaching success. In the research domain, the personal and professional balance of the untenured faculty members was the social factor that had the largest positive correlation with the SDT variables of *autonomy* and *competence*. The findings identified *competence* was a strong and positive predictor for untenured faculty members' intrinsic motivation for research.

Although the predictors for intrinsic motivation within the different domains were different, Stupniksy et al. (2017) found significant direct effects of intrinsic motivation on perceived and expected success in both teaching and research. The study demonstrated that social environment factors, for example, collegiality and balance, were strongly correlated with the satisfaction level of three psychological needs, which can strongly predict both the perceived and expected success of untenured faculty.

Another study by Stupnisky et al. (2018) also indicated the effectiveness of using the three psychological needs to predict faculty members' motivations for incorporating effective teaching practices. A total of 14,512 faculty members from 19 colleges and universities were recruited to complete the work-related basic need satisfaction survey (Stupnisky et al., 2018). A confirmatory factor analysis was conducted to examine the relationships among the three basic psychological needs, motivation types, and four teaching outcomes: instructional clarity, higher-order learning, reflective and integrative, and collaborative learning (Stupnisky et al., 2018). Consistent with SDT literature, Stupnisky et al. (2018) reported that all three psychological needs were significant and direct indicators for faculty members' autonomous motivations.

Stupnisky et al. (2018) discovered that faculty members in different types of institutions showed different degrees of demands for the three psychological needs. For example, *autonomy* better predicted faculty members' performances in research universities, while *relatedness* was the strongest predictor for faculty members from universities only offering bachelor's degrees. Stupnisky et al. (2018) suggested that this difference might be due to faculty members who work in research universities valuing research over teaching. In contrast, faculty members at four-year colleges rely more on their connections with their students and colleagues to enhance their autonomous motivation (Stupnisky et al., 2018).

The significance of a supportive environment for faculty autonomy is also illustrated in Lechuga's (2014) study. Lechuga (2014) interviewed 15 STEM faculty members at a public research university in order to investigate their motivations regard to engaging in scholarly activities. The findings showed that STEM faculty members

learned the appropriate strategies to by which satisfy their needs for *autonomy*, *competence*, and *relatedness* in their disciplinary socialization process. Although personal and social interactions, such as their relationships with their departmental colleagues, were concluded to be important elements for their motivation to complete scholarly work, faculty members claimed that those individuals who relied on mentoring from others were unsuited for faculty position in research universities. Faculty members also reported being reluctant to ask for advice from others to fulfill their needs for *competency*. In addition, faculty members showed low interest in offering suggestions to others to avoid interfering with other faculty members' *autonomy* in their scholarly work. Lechuga (2014) was interested in how faculty members socialized to satisfy their basic psychological needs within the culture of each specific discipline and concluded that the disciplinary environment had a significant impact on faculty members' intrinsic motivation at the workplace. Lechuga (2014) then suggested creating autonomy-supported work environments in research universities where it is acceptable for STEM faculty members to ask for help.

Significance of Relatedness for Underrepresented Faculty

Although *autonomy* is the core of supporting autonomous motivation, not all social conditions support *autonomy*. For instance, faculty members may not have high *autonomy* in the tenure and promotion process due to the administrative requirements. However, humans, as social beings, often adopt behaviors that are considered social norms. Performing those social norms helps individuals stay connected with others in the same social context, which is the primary psychological need for *relatedness* (Ryan &

Deci, 2017). This process of transforming external values, beliefs, or behavioral regulations into one's own values is called *internalization* (Deci & Ryan, 1985b).

Internalization is a central construct for transforming extrinsic motivation into more autonomous motivation. For example, internalized extrinsic motivation is more autonomous than fully controlled motivation. The internalization process may start as forced regulations (e.g., parents monitor young children to wash hands before meals) to "*integrated regulation*" (Ryan & Deci, 2017, p. 231) (e.g., children wash hands before meals even when parents are not around). *Integrated regulation* represents "the most autonomous form of extrinsic motivation" (Ryan & Deci, 2017, p. 231). Therefore, internalized extrinsic motivation is highly relevant to satisfying the needs for *competence* and *relatedness* when *autonomy* is absent.

Skewes et al. (2017) conducted a matched case study to understand how psychological needs could be fulfilled in the situation of low *autonomy*. The authors recruited 13 STEM faculty members (six women and seven men) who were going through promotion and tenure review procedures during the year of the study. Since the tenure review was conducted under a controlled environment, faculty members often experience low *autonomy* during the process, which means that they had little flexibility and control over the outcomes. Faculty members were asked to explain how they prepared themselves for the promotion and tenure reviews (Skewes et al., 2017). Skewes et al. (2017) predicted gender as a significant variable for satisfying the psychological needs under the low *autonomy* condition, and the analysis of the interview transcripts indicated that the female and male faculty members used different strategies to fulfill their psychological needs (Skewes et al., 2017). The male faculty members often focused

on their need for *competence* only, while the female faculty members demonstrated higher demands for *relatedness* (Skewes et al., 2017). To be more specific, although all of the faculty members attended the institution's information session on the tenure review preparation process, only the male faculty members claimed the practical instruction of the session as the most valuable outcome, whereas the female faculty members acknowledged more value in the social support gained from networking with their colleagues during the session (Skewes et al., 2017). Although both the male and female faculty members identified receiving information about the tenure review process as the key to fulfilling their need of *competence*, the male faculty members often referred to the formal written documents provided by the university for resolving questions, while the female faculty members relied on informally shared information from colleagues more often. More importantly, only the female faculty members mentioned the value of peer feedback in terms of *competence* fulfillment in this low *autonomy* context. Skewes et al. (2017) concluded that all faculty members have strong demands for *competence* in a low *autonomy* context, but different approaches are used based on the faculty member's gender. In the low *autonomy* condition, the female faculty members showed significantly stronger demands for *relatedness* than their male counterparts, which indicated a stronger influence of social context on the females than on the males (Skewes et al., 2017).

Also, faculty members who experienced a risk of being marginalized at the workplace showed a significantly higher demands for *relatedness* than others (Lechuga, 2012). In an earlier study about Latino faculty members, Lechuga (2012) discovered that minority faculty members often internalized negative perceptions of their research performances. This type of negative internalization directly impacted faculty members'

self-perceptions of their *competence*. Consequently, faculty members' autonomous motivations for research activities were diminished due to their self-perceived low competence (Lechuga, 2012).

Lechuga (2012) reported the negative influence of the STEM disciplines' culture on Latino faculty members' intrinsic motivations for research activities. A total of 15 Latino faculty members in STEM disciplines were interviewed about their work experiences at a research university (Lechuga, 2012). Faculty members claimed that their discipline's culture often holds different values than that of their personal cultural backgrounds (Lechuga, 2012). The findings suggested that minority faculty members internalized negative perceptions towards their research *competences* within unwelcomed professional social settings (Lechuga, 2012). Latino faculty members expressed their struggles with negative perceptions of their scholarly proficiencies, which can negatively affect their research productivities. In such cases, Lechuga (2012) asserted that minority faculty members had a higher demand for *relatedness* because they needed to build senses of belonging in the STEM community to fulfill their basic psychological needs to increase their autonomous motivations for research activities.

Besides, the Latino faculty members explained that, in Latino culture, it is essential to maintain close relationships with colleagues at workplaces, which is not the social norm in their disciplinary culture (Lechuga, 2012). These faculty members agreed that a close relationship with friends and family members directly influenced their scholarly productivities (Lechuga, 2012). Lechuga (2012) concluded that internalizing unwelcomed academic values and culture can diminish the intrinsic motivations for underrepresented faculty members' engagement in research activities. Minority faculty

members may lack feelings of belonging within their social groups, such as departments (Lechuga, 2012). The study indicated that minority faculty members often relied on internally constructed values to locate and connect with others in an extended network, such as at different institutions, to satisfy their needs for *relatedness* (Lechuga, 2012).

Similarly, Seipel and Larson's (2018) study stressed the significance of *relatedness* for underrepresented faculty members. They proposed a SDT model to examine the relationship between environmental support, such as departmental, administrative, and family support, and faculty members' well-being and job satisfaction (Seipel & Larson, 2018). A total of 104 non-tenure-track faculty members at a research university completed a faculty satisfaction survey (Seipel & Larson, 2018). The study results showed that faculty members' perceived *relatedness* was a critical mediation by which non-tenure-track faculty members interpret environmental support and evaluate their job satisfaction (Seipel & Larson, 2018).

SDT is not only a robust framework by which to investigate and understand faculty motivations, but also an effective framework through which to support the design and development of programs intended to satisfy the basic psychological needs of underrepresented faculty members. Montana State University offered a gender diversity project (TRACS Program) based on the SDT framework to support female faculty members in STEM fields (Smith et al., 2017). The three-year program was initiated with three goals: enhancing research capacity and opportunity, enhancing work-life balance, and enhancing cultural attunement (Smith et al., 2017). While the program targeted female faculty members in STEM disciplines, but all faculty members were invited to the program activities (Smith et al., 2017). A total of 152 faculty members from STEM and

non-STEM disciplines completed surveys at three time points (i.e., Year 1, Year 2, and Year 3) (Smith et al., 2017). Faculty members indicated significantly greater job satisfaction and psychological need satisfaction after the completion of the program than before their involvement in the program (Smith et al., 2017). Also, when a faculty member indicated a higher perceived involvement in the program, they reported more positive changes in their psychological need satisfaction regardless of their gender or discipline (Smith et al., 2017). Smith et al. (2017) concluded that diversity programs with a SDT framework could benefit all faculty members who perceive themselves as involved or engaged and suggested applying a compound conceptualization of psychological needs for faculty development instead of a sole focus on *autonomy* or *competence*.

Bouwma-Gearhart's (2012) study also specified that *relatedness* is key to improving faculty members' engagement in TPD. The author conducted a grounded theory study to explore the motivations for STEM faculty members at a research university to engage in TPD. A total of 12 STEM faculty members completed a survey and an in-depth, semi-structured interview about their experiences with TPD (Bouwma-Gearhart, 2012). The study reported three motivating factors for faculty members' engagement in TPD, such as social relations, teaching competence, and teaching autonomy (Bouwma-Gearhart, 2012). First, faculty members conveyed their desire for a safe and supportive environment for pedagogical discussions, which they found with TPD (Bouwma-Gearhart, 2012). Faculty members believed that their engagement in TPD fulfilled their need to build social relations with others in the teaching domain (Bouwma-Gearhart, 2012). Although Bourwma-Gearhart (2012) did not use the term "teaching

community," the study's findings indicated that community building was a key motivator for faculty members' engagement in TPD.

Second, faculty members claimed that TPD fulfilled their need for teaching competence enhancement (Bouwma-Gearhart, 2012). Faculty members admitted that their initial engagements in TPD were due to low self-perceived teaching competence, but their engagement in TPD helped them to improve their self-efficacy in teaching (Bouwma-Gearhart, 2012). Third, faculty members believed that their engagement in TPD fulfilled their need for autonomy in the teaching domain (Bouwma-Gearhart, 2012). Faculty members at research universities are often independent learners that hold a significant level of *autonomy* regarding their research and teaching practices (Bouwma-Gearhart, 2012). However, faculty members' low self-perceived teaching competence has not consonant with their high self-perceived research competence as the study indicated (Bouwma-Gearhart, 2012). The study findings showed that strengthening faculty members' teaching competence via TPD ultimately increased their autonomy in teaching because they became more comfortable when making decisions regarding their teaching practices (Bouwma-Gearhart, 2012).

Mixed Results for External Rewards

It has been assumed that autonomous motivation leads to high-quality outcomes and performance, however, in many conditions, people do not feel autonomously motivated for the tasks that they must complete, such as memorizing mathematical formulas for tests. Often, external events, such as rewards or feedback, are used to stimulate an individual's interests with the hope that external stimulations will enhance the individual's autonomous motivation.

However, Deci's (1975) early studies showed that the presence of external rewards might actually diminish autonomous motivation. In one study, Deci (1971) compared motivation for two groups of college students working on the same puzzle game under different reward conditions. One group received monetary rewards based on the number of puzzles solved, while the other group did not receive a reward (Deci, 1971). The findings showed that the students in the reward group experienced a decrease in their subsequence autonomous motivation compared to the students in the group not provided with rewards (Deci, 1971).

Studies have shown that introducing external rewards before the activity can transform intrinsic motivation into extrinsic motivation (Deci & Ryan, 1985a; Ryan & Deci, 2017). When individuals complete an activity for rewards, they perceive the rewards as a way to control their behaviors, which reduces their ownership of the activity and, in turn, diminishes their autonomy for the task (Deci & Ryan, 1985a). Certainly, an emphasis on external rewards can stimulate immediate actions (e.g., young children will complete the task quickly to receive candies), but extrinsic motivation can cause negative effects on the individual's subsequent motivation for the task (e.g., young children will not be motivated to continue the task unless you give them more candies). Ryan and Deci (2017) were concerned that using rewards in an activity might signal the value of the activity as low.

Stupnisky et al. (2018) agreed that offering external rewards was not an effective approach to increasing faculty members' intrinsic motivations. Consistent with Ryan and Deci's (2017) argument, Stupnisky et al. (2018) stressed that the type of motivation is more critical than the strength of the motivation in predicting the expected outcomes. In

their study, autonomous motivation predicted all four types of teaching outcomes, but extrinsic motivation predicted none of the outcomes (Stupnisky et al., 2018). Thus, Stupnisky et al. (2018) recommended that colleges and universities concentrate on creating supportive social conditions for autonomous motivation instead of expecting financial incentives to change faculty members' behaviors.

Similarly, Stokowski et al. (2018) found that faculty members' satisfaction for their work can be predicted by intrinsic but not extrinsic motivation. They focused on the correlation between the types of work motivation and job satisfaction of faculty members in sport management. A total of 193 full-time faculty members who worked in global sport management programs at different colleges and universities were surveyed regarding their job satisfaction (Stokowski et al., 2018). The findings showed that faculty members' job satisfaction was significantly and positively correlated with their autonomous motivation and *identified regulation* (Stokowski et al., 2018). The authors reported that faculty members valued work, supervision, and colleagues more than pay, administrative systems, and external rewards. Also, faculty members were likely to internalize the values that were endorsed by the social context of the sport management discipline, which contributed to faculty members' *autonomy* at workplace.

These counterintuitive findings about external rewards inspired many scholars to investigate the effects of external rewards under different conditions. Although Ryan and Deci (2017) do not encourage the use of external rewards to enhance autonomous motivation, they discovered that the effects of the rewards depend on how they are introduced and interpreted by the individuals. In addition, Ross and Rothstain (1976)

reported that rewards only have negative effects on autonomous motivation when they are introduced to students before the activity.

An important conclusion of SDT research is that the impact of external rewards on motivation varies in terms of the delivery methods of the rewards. For instance, Zaharie and Seeber (2018) reported that different reward settings resulted in different acceptance rates for faculty members' engagement in journal review activities. They tested the effectiveness of external rewards as a solution by which to increase faculty members' engagements in peer reviews for scientific journals. Faculty members were rewarded for having their names acknowledged in the journal under three conditions: 1) engagement contingent: faculty members were rewarded for mere agreement to be peer reviewers with no requirement to complete the reviewing process, 2) task completion contingent: faculty members were given rewards after they completed the reviewing process, and 3) performance contingent: faculty members were given rewards based on their performance during the reviewing process (Zaharie & Seeber, 2018). A total of 1, 865 faculty members were grouped into four experimental settings: no-reward, engagement, completion, and performance (Zaharie & Seeber, 2018). The findings showed a significantly higher acceptance rate for engagement and completion reward settings and a significantly lower acceptance rate for the performance reward setting (Zaharie & Seeber, 2018). Zaharie and Seeber (2018) concluded that faculty members might perceive the performance reward setting as a more controlling condition, which increases the pressure on faculty members to invest more time and effort into a voluntary activity. Overall, the dominant voice in motivation studies, including SDT studies (Deci,

1971; Deci & Ryan, 1985a; Zaharie & Seeber, 2018), suggests that external rewards are an ineffective approach by which to increase autonomous motivation.

However, a complete denial or ignorance of external motivation is inappropriate because extrinsic motivation can be transformed into more autonomous motivation under a supportive social condition (Ryan & Deci, 2017). Faculty members may start with extrinsic motivation, such as financial incentives, to participate in an event, but when the social conditions support their psychological needs, their motivation could transform from extrinsic to intrinsic motivation. Although Ryan and Deci (2017) have claimed that external motivation could never be transformed into fully autonomous motivation, they have agreed that extrinsic motivation could be transformed into *integrated regulation*, a more autonomous type of motivation, through the internalization process. For example, in Bouwma-Gearhart's (2012) study, almost all of the faculty members demonstrated a somewhat external motivation for their initial involvement in TPD, namely external pressures to improve their teaching competence. However, while participating in TPD, faculty members indicated that they experienced the fulfillment of their psychological needs, which resulted in greater intrinsic motivation (Bourwma-Gearhart, 2012).

Jumonville's (2014) study presented a similar pattern. A private liberal arts university encouraged faculty members to incorporate information literacy into the curriculum by offering a grant with a financial incentive (Jumonville, 2014). Jumonville (2014) examined all of the grant applications and post-course assessments to develop a deeper understanding of faculty motivation and engagement. A follow-up survey was conducted to confirm the sustainable impact of the grant project (Jumonville, 2014). Although Jumonville (2014) was concerned that the financial incentive has been the sole

motivation for most of the faculty members to participate in the grant project, the findings indicated that faculty members maintained a high level of autonomy in the design and development phases of the project. The high level of faculty autonomy was supported by the freedom of faculty members to select information literacy learning goals and concepts that matched their other pedagogical goals (Jumonville, 2014). A post-course assessment analysis indicated that supporting faculty members in their desire to align the information literacy measures with other pedagogical goals enhanced their autonomy as well as the scope and impact of the assessment results (Jumonville, 2014). Enhanced faculty autonomy encouraged faculty members to have a greater reflection on their teaching and course design. The results of the follow-up survey demonstrated an ongoing impact of the grant project on faculty members' teaching practices and students' information literacy learning (Jumonville, 2014). Faculty members indicated high motivation to continue developing the courses they proposed for the grant even when the financial incentive was not presented anymore. Jumonville's (2014) study revealed strategies by which to diminish the negative impact of administrative requirements on faculty autonomy. Faculty members may have been initially motivated to join the project for sole external reasons, such as the grant money. However, when asking faculty members to describe the connections between the required innovation and their disciplinary contexts, set the stage for faculty members to attain more autonomous motivation, namely *integrated regulation*.

TPD in Higher Education

A revolutionary change related to integrating technology in higher education started several decades ago (Gilbert, 1996; Green, 1996). However, the institutional

infrastructure transformation and faculty members' adoption of technology to improve instruction remains at a superficial level after decades of effort (Perna & Ruiz, 2016). Colleges and universities have significantly invested in hardware and software for instructional purposes, but none of these technologies has fundamentally changed the nature of teaching and learning (Selwyn, 2016). While faculty members have replaced blackboards with PowerPoint slides, they continued to use teacher-centered and lecture-dominated approaches to teach.

The U.S. Department of Education and Office of Educational Technology (2017) made a call "to action for transformational learning enabled by technology at all levels of our education system" (p. 4). Educators and administrators have agreed that integrating technology into instruction can increase educational productivity, reduce costs associated with education, and make better use of teacher time (Lei & Zhao, 2007; U.S. Department of Education, n.d.). Faculty members in higher education are pressed to integrate technology, such as learning management systems, in their teaching to respond to the public call. Meanwhile, colleges and universities have realized the significance of offering TPD to support faculty members' adoption of technology in their teaching practices.

History of Faculty Development and TPD

The history of faculty development in higher education in the United States is tied to the specialization of college teaching. When the first American university, Harvard University, was founded in 1636, the dominant goal of higher education was to train public leaders with high religious and moral principles (Park, 1979). A faculty member was often responsible for all subjects due to unclear discipline boundaries. College

teaching was not considered as profession, but, instead, a springboard for a better position, a point-of-view held until the mid-18th-century (Lewis, 1996). The lack of discipline specialization often led to mismatched positions, such as chemistry and history being taught by a law graduate, or a chemistry professor assigned to teach Greek and European Studies (Park, 1979). Fortunately, colleges and universities soon realized the value of specialized experts due to the development of disciplinary specializations and innovative technology (Park, 1979). In late 19th-century, Harvard University proposed shifting its faculty population from "non-specialized, institutionally loyal academic gentlemen" to "highly specialized, intensely competitive professional academics" (Rudolph, 1977, p. 155). The rising expectation for trained experts urged colleges and universities to establish formal faculty development programs.

According to Sorcinelli et al. (2006), the original goal of faculty development was to improve the faculty members' research competence. It has long been assumed that if you knew the subject, you could teach it (Lewis, 1996; Park, 1979). Back then, formal pedagogical training was not included in any doctorate program to prepare graduates to teach in their specialized area (Ouellett, 2010). However, students in the late 1960s protested against the irrelevant curriculum and uninspired teaching at large universities where the leading scholars were often working (Gaff & Simpson, 1994). In reaction to students' demands for innovative teaching approaches, the University of Michigan and University of Massachusetts created the first faculty development programs that emphasized teaching excellence in the 1970s (Lewis, 1996). In the 1980s, higher education encountered a surge of faculty loss due to the widespread "academic burnout"

(Lewis, 1996, p. 29). Faculty development programs then broadened their scope to cover the personal wellness of faculty members in responding to the change (Lewis, 1996).

In the 1990s, faculty members began to argue for a diversified definition of scholarship that included teaching and service instead of only focusing on research (Boyer, 1990). University and college administrators also sent a clear message to faculty members that teaching excellence was the responsibility of the institution (Gaff & Simpson, 1994). In addition, during the 1990s, parents and legislators called for accountability in the U.S. higher education system (Ewell, 2013). In order to respond to these situations, the number of faculty development programs steadily increased as the colleges and universities worked to ensure that undergraduates would experience a high quality of instruction (Lewis, 1996). Growing membership in organizations such as the POD Network also marked the increasing attention on faculty development in the higher education community (Ouellett, 2010). In the 21st-century, faculty development programs are expected to respond to institutional problems and challenges and the integration of technology into teaching is one of the top challenges (Sorcinelli et al., 2006).

Lessons Learned from Technology Integration in K12 Education

Although higher education and K12 education are two different contexts, TPD leaders and administrators in higher education could learn and borrow ideas from K12 practices regarding technology integration. Ertmer (1999) proposed a framework to elaborate barriers for teachers' adoptions of technology in K12 education, named first- and second- order barriers. First-order barriers refer to external barriers, such as a lack of time, resources, and training (Ertmer, 1999). In contrast, second-order barriers are related

to teachers' internal changes, such as pedagogical beliefs (Ertmer, 1999; Ertmer et al., 2012).

Educational researchers have extensively investigated barriers for K12 teachers' technology integration. For example, Hechter and Vermette (2013) surveyed 433 science teachers to determine the types of barriers that they face for technology integration in K12 science teaching. A series of first-order barriers were identified in that study, including limited access to technology, limited time to learn and plan technology integration, inadequate IT support, a lack of training, and a lack of age and language appropriate resources. Inan and Lowther (2010) also reported that teachers' technology competence, IT support, administrative support, and technology availability were key factors that impacted teachers' readiness to integrate technology based on survey results from 1, 382 K12 teachers.

While teachers may be frustrated by numerous first-order barriers (Ertmer, 1999), appropriate administrative policies and sufficient financial support could significantly reduce them. However, K12 studies have shown that teachers perform low-level of technology uses even with the reduction of first-order barriers (Newman, 2002; Sandholtz et al., 1997). Koehler and Mishra (2009) proposed the concept of technological pedagogical content knowledge (TPACK) to address the significant factors impacting teachers' effective practices with technology. The TPACK framework presented a complex interaction of teachers' knowledge of the content, pedagogy, and technology (Koehler & Mishra, 2009). According to TPACK, teachers' effective integration of technology requires a solid understanding of the affordance of technologies, pedagogical techniques to teach content with technology, and the knowledge of how to use technology

facilitate students in regard to bridging new experiences with existing knowledge (Koehler & Mishra, 2009). Studies have shown that effective trainings and education could support teachers' TPACK development (Ersanli, 2016; Hu & Galstaun, 2021; McGrath et al., 2010).

In addition to their knowledge, teachers' pedagogical beliefs are also critical to their adoption of technologies in teaching (Ertmer, 2005; Ertmer & Ottenbreit-Leftwich, 2010). It is worth noting that, in addition to teachers' beliefs about technology, teachers' "fundamental beliefs about what is important in student learning and thus teaching (regardless of technology use)" are essential in teachers' technology integration (Kim et al., 2013, p. 77). In a study of the pedagogical beliefs of 22 teachers, the findings showed that teachers' epistemology of knowledge was significantly correlated with their beliefs about effective methods of teaching, while teachers' beliefs about effective methods of teaching were significantly correlated with their practices with technology (Kim et al., 2013). In a study of eight award-winning teachers, Ottenbreit-Leftwich et al. (2010) confirmed that teachers who performed effective teaching practices with technology had a belief system that centered around the students' needs and engagement. Although it is challenging to change teachers' pedagogical beliefs (Ertmer, 2005), effective professional development and education could facilitate teachers to develop a more constructive view of pedagogy and positive beliefs about technology (Kopcha, 2012; Lowther et al., 2008; Mouza, 2009).

In addition, K12 studies have offered innovative approaches and design for professional development that could be adopted by higher education. For example, Colwell and Hutchison (2018) demonstrated a Twitter-based professional development

model to help pre-service teachers build a professional learning network in literacy education. The findings showed that, although some skeptics existed regarding the effectiveness of an online network, preservice teachers valued the accessibility of the educators, experts, and resources that were offered by Twitter (Colwell & Hutchison, 2018). In another study, Colwell et al. (2012) demonstrated the use of blogging in pre-service teachers' learning and suggested a wider adoption of blogging for teachers' professional development to engage teachers in literature responses. These ideas are not only innovative for K12 teachers' professional development, but also have the potential to be incorporated into higher education context.

Faculty development in higher education faces a set of different challenges compared to K12 teacher development, but K12 studies and frameworks on technology integration have significantly benefited and informed the practices of the design and development of faculty development in higher education. Concepts like first- and second-order barriers and TPACK have inspired many studies of faculty development in higher education (Alleman et al., 2013; Maor, 2017; Stover & Veres, 2013).

TPD in Higher Education

Along with the evolution of faculty development, investigation into effective designs for faculty development programs have persisted. Faculty leaders and administrators constantly share successful cases of TPD in order to generate principles and frameworks to guide others to create effective programs by which to support faculty members in higher education (Cohen, 2010; Robertson, 2010; Tomei et al., 2016). For instance, Cook and Marincovich (2010) proposed leadership guidelines for TPD programs in research universities, Reder (2010) discussed TPD in the context of small

colleges, Burnstad and Hoss (2010) presented innovative practices in community colleges. Other examples include programs that addressed the significance of TPD for adjunct faculty members (Tarr, 2010) and underrepresented faculty (Tuitt, 2010). If a college or university is interested in creating a TPD program, the existing literature provides abundant models for consideration. However, most studies were based on individual cases and fail to provide a generalized conceptual framework for those institutions wishing to contextualize their TPD programs.

An Expanded TPD Model

O'Sullivan and Irby (2011) argued that most TPD models have been generated from individual case studies and, consequently, fail to serve the purpose of guiding TPD research and practices in a conceptual aspect. They reviewed TPD models in different fields, including teacher education, medical education, quality improvement programs, and workplace learning frameworks, and then proposed a conceptualized TPD model to reframe the research agenda for TPD studies (see Figure 1.2 in chapter 1). O'Sullivan and Irby (2011) proposed four core constructs for the faculty development community: participants, facilitator, program, and organizational context. The faculty development community is embedded in a larger context called the workplace community, which includes four constructs: mentoring, relationships, organization culture, and activities (O'Sullivan & Irby, 2011).

Each construct in the faculty development community is associated with and influenced by a construct in the workplace community (O'Sullivan & Irby, 2011). For example, the content of a TPD program should be associated with the tasks and activities of faculty members in the workplace. The facilitators of TPD are related to mentoring

and coaching activities in the workplace. The participants' interactions in the TPD programs connect with their relationships and networks in the workplace. Finally, the context of TPD is embedded in the organization's systems and culture in the workplace.

O'Sullivan and Irby (2011) stressed that social interactions within the faculty development community are as important as the behaviors of the individual participants in the TPD programs. TPD studies have long neglected the connection between the social context of the faculty development community and the workplace community (O'Sullivan & Irby, 2011). TPD researchers need to redefine and shift their research questions to examine the role of TPD in the larger workplace community instead of centering on individual faculty members (O'Sullivan & Irby, 2011).

O'Sullivan and Irby's (2011) emphasis on the significance of the social context of TPD regarding TPD design is aligned with Ryan and Deci's (2017) theory about the influences of social context on human motivation. Both frameworks provide robust structures within which to frame TDP research on faculty motivation by focusing on the influences of the social context on individual's behaviors. Based on the four pairs of constructs identified in O'Sullivan and Irby's (2011) conceptual model, a total of 14 empirical studies were selected and reviewed to explore TPD in relation to organizational culture, activities, relationships, and mentoring (see Table 2.2).

Organization Culture and SoTL

Cultural studies have demonstrated that culture has a strong influence on shaping individual's behaviors (Geertz, 1966), beliefs and taken-for-granted knowledge (Geertz, 1975), identities (Gupta & Ferguson, 1992; Kellner, 2003), motivation (Chen et al., 2005), and learning (Hale-Benson, 1986). Culture exists in every society, community,

and group. Higher education institutions, as important organizations of society, often reflect the macro-culture of the society as well as its own organizational culture. Organizational culture is defined as shared philosophies, ideologies, values, assumptions, beliefs, expectations, attitudes, and norms that were developed over time in organizations (Zhu & Engels, 2014), which represents the social norms that are followed by the population that works at the organization. Studies have shown that, while organizational culture has a positive influence on employees' motivation and creativity (Hon & Leung, 2011), it can also act as a barrier (Jafri, 2010).

Higher education institutions need to serve different societal demands that result in different types of institutions. These differences among institutional types often lay in their prioritization of these societal demands. Thus, a university's culture embodies its priorities and values, which constantly manipulates faculty members' decisions at work. "Publish or perish" is a familiar phrase for faculty members at research universities and summarizes the stress that faculty members associated with publishing demands. According to the 2015 edition of the Carnegie Classification of Institutions of Higher Education, doctoral/research universities were required to award at least 20 research doctorates annually and engage in research activities in both STEM and non-STEM fields. Doctoral/research universities, therefore, naturally prioritize research-related activities over other activities. This research-driven culture significantly impacts faculty members' perceptions of their career success and, ultimately, determines their motivation at work.

Faculty members are expected to undertake multiple responsibilities, including research, teaching, and service, but often need to trade off other responsibilities for more

research time. Previous studies have shown that faculty members at research universities consistently report that obtaining grants, conducting research, and publishing their work are their priorities in their careers (Knight, 1998; Santos, 2016). Faculty members have also reported that they must always be careful in assessing how participating in other activities will impact their research productivity (Gladwin et al., 2014). It is imaginable that under the pressure of publishing in peer-reviewed journals (Miller et al., 2011), faculty members at research universities are less likely to be motivated to participate in TPD that do not contribute directly to their research productivity. In fact, many faculty members at research universities perceive research and teaching as competitors for their limited time (Alpay & Jones, 2011; Miller et al., 2011).

The status quo of the research-oriented culture at research universities is not going to change any time soon. If we hope to recruit more faculty members to participate in TPD, the design of TPD must adapt to the research-oriented culture on campus. Rogers (2003) asserted that innovations need to be tailored to fit cultural values and past experiences when attempting to initiate changes in an organization. For example, the tension between teaching and research has commonly been caused by considering the two to be fragmented roles (Alpay & Jones, 2011). In order to dispel this tension, scholars have demonstrated the possibilities of integrating teaching and research into one role (Colbeck, 1998; Toni et al., 2014). Boyer (1990) proposed that a variety of scholarship should be equally valued in higher education. Other than the "scholarship of research," Boyer (1990) recommended offering full recognition of the "scholarship of teaching and learning (SoTL)" (p. 23).

In recent decades, SoTL has gained a wide range of attention at higher education institutions to support evidence-based teaching philosophies (Beach et al., 2016). Yet, much of the literature documented the challenges of SoTL implementation in higher education, more empirical studies demonstrating successful cases or models of integrating SoTL in TPD are needed (Case, 2015; Chalmers, 2011; Potter & Kustra, 2011; Tight, 2018). To bridge the gap in the literature, Charlier and Lambert (2020) evaluated the long-term effects of a SoTL program designed for a hybrid learning environment in higher education. A total of 96 faculty members were surveyed about their experiences during and after the SoTL program (Charlier & Lambert, 2020). The findings showed that faculty members agreed that the design of the SoTL program provided an open and high autonomy learning environment, which has long-term effects on their reflexivity, self-efficacy, beliefs about teaching, research practices related to teaching and learning, and teaching practices (Charlier & Lambert, 2020). Charlier and Lambert (2020) concluded that a rigorous TPD design must take several factors into account: the shared views within the group of faculty members, individual learning differences, the interactions between faculty members and environment, and faculty members' perceptions of their working environments. Charlier and Lambert's (2020) conclusions are consistent with O'Sullivan and Irby's (2011) arguments about the impact of organizational culture on TPD as well as the importance of the interactions of the TPD community and larger work environment for faculty members.

Miller-Young et al. (2018) reported on the discomforts related to faculty members' engagements in SoTL activities that were caused by their disciplinary tradition and epistemology. The findings showed that STEM faculty members described their

discomfort related to the perceived subjectivity of SoTL, such as using self-reported data in the evaluation process (Miller-Young et al., 2018). STEM faculty members were concerned about the conflict between the objective tradition in their disciplines and the reflexivity of SoTL (Miller-Young et al., 2018). In contrast, faculty members from non-STEM disciplines, such as humanities, expressed their discomfort with the perspective of SoTL to study an observable reality, such as viewing students as data and interpreting student text using a literal approach (Miller-Young et al., 2018). "SoTL was simultaneously too subjective and too objective in a multi-disciplinary group." (Miller-Young et al., 2018, p. 3). The findings of Miller-Young et al. (2018) supported Charlier and Lambert's (2020) conclusion related to the importance of interactions between faculty members and their working environment regarding their engagement in TPD, such as SoTL. When working with faculty members at research universities, we must take into consideration the research-driven culture, disciplinary traditions, and working environments when attempting to increase their participation in TPD.

Activities and Content

A prevailing and continual challenge in 21st century higher education is to optimize the use of advanced technology in routine teaching and learning activities (Dahlstrom, 2015). For example, a national survey of 191 colleges and universities in the U.S. showed that the most common types of TPD were resources and trainings related to learning management systems (LMS) (90.4%), technical service and support (89.0%), academic resources for online education (87.8%), and consultation with instructional designers (84%) (Herman, 2012). Herman (2012) also reported that TPD related to LMS, consultation, and technical service were the TPD types offered the most frequently

among all of the reporting institutions. Herman (2012) investigated the types and frequency of TPD at institutions with an existing center for teaching and learning and found that many TPD programs for higher education faculty members focused on technical competence, information about available resources, and technical support unrelated to pedagogical design (Herman, 2012). The pedagogical implications and discussions of effective online teaching practices were not considered or identified as key elements to any type of TPD in Herman's (2012) study.

Meyer and Murrell (2014) attempted to address pedagogical concerns in their national study of TPD content in higher education by including questions about pedagogical frameworks and learning theories, such as experiential learning, problem-based learning, and critical thinking in TPD (Meyer & Murrell, 2014). They collected responses from TPD staff across different types of institutions, including doctoral, master's, baccalaureate, and associate. Although the integration of individual technological tools (e.g., CMS, Wikis, mobile technologies) was a commonly offered topic of TPD, the findings indicated that student learning assessments were the most frequent TPD content across all types of institutions (Meyer & Murrell, 2014), which was probably due to the increasing public pressure on higher education accreditation (Ewell, 2013).

Meyer and Murrell (2014) also reported a difference between the frequency of TPD regarding technological competence versus pedagogical discussions across different types of institutions. Their findings indicated that doctoral and associate institutions valued the use of pedagogy more than the use of digital tools (Meyer & Murrell, 2014). The only digital tool that was highly valued by all types of institutions was LMS because

LMS is the most common platform for online education (Meyer & Murrell, 2014). Meyer and Murrell (2014) concluded the inconsistency in the content of TPD might be due to rapid changes in specific digital tools. They asserted that "the field is split between teaching tools versus teaching pedagogy" (Meyer & Murrell, 2014, p. 13) and future research is needed to explore how and why the field is changing. Yet, critiques of the lack of pedagogical support for meaningful technology integration in TPD content have emerged in the field and called for attention on how to bridge pedagogies with technological tools (Dysart & Weckerle, 2015).

Time management is often identified as a barrier for faculty members' engagements in different activities (Rosser & Tabata, 2010). The heavy workload of faculty members indicated that TPD need to be offered at convenient times and in accessible ways. TPD studies have explored faculty members' preferences of TPD formats in different contexts. Kinuthia (2005) survey 152 full-time faculty members at historically Black colleges and universities (HBCUs) and found strong preferences for individual consultations and workshops in terms of TPD formats as well as a technological competence gap among faculty members in relation to their uses of web-based tools for online classes. The author concluded that TPD would be most beneficial and engaging for faculty members at HBCUs when offering meaningful incentives, such as books related to online education, and discipline-specific practices.

In a more recent study, Lowenthal et al. (2012) studied the preferences of faculty members across different types of institutions in higher education regarding TPD formats and reported a general preference on formatted instruction of TPD. Faculty members at research universities in particular preferred TPD formats such as online instruction and

one-hour workshop and reported the lowest attendance for TPD across institutions (Lowenthal et al., 2012). These faculty members identified other competing priorities as their top barrier for participation in TPD (Lowenthal et al., 2012). Lowenthal et al. (2012) also reported a strong interest of faculty members across institutions in TPD related to technology.

Canale et al. (2014) reported different conclusions from a survey of 120 faculty members at a large research university. These faculty members reported a strong preference for F2F workshops for their participation in TPD, followed by individual consultations (Canale et al., 2014). Faculty members also requested guest speakers for TPD and mini-grants to motivate their participation in TPD (Canale et al., 2014). However, in a different study of 68 faculty members at a large research university, Taylor and McQuiggan (2008) reported self-paced online materials/modules were the most requested format of TPD, followed by informal F2F events. These faculty members also requested practical teaching showcases from their peers, the uses of technologies, and resources related to specific teaching strategies (Taylor & McQuiggan, 2008).

These studies illustrate that faculty members' preferences related to TPD formats are not consistent. However, faculty members share some common traits in their learning approaches. For example, faculty members generally prefer informal learning environments to formal instruction (Herman, 2012; Taylor & McQuiggan, 2008). Individual consultations or mentoring are often valued more than other formats (Canale et al., 2014; Herman, 2012; Kinuthia, 2005). Financial incentives are often less meaningful to faculty members at research universities compared to rewards related to the TPD topic, such as books (Canale et al., 2014; Taylor & McQuiggan, 2008).

No single best TPD format exists for all faculty members, even when faculty members are at the same type of institution. Herman's (2012) study indicated that higher education institutions offer 15 to 16 programs on average, which means that a wide variety of formats for TPD are necessary to engage faculty members' participation in TPD.

Relationships and Networks

Knowles (1973) claimed that social relationships serve as a critical source of motivation for adult learning. Motivation studies have well-documented how positive interpersonal relationships at work motivate employees to achieve higher performances and also increase their job satisfaction (Hardré, 2003). Studies in higher education have reported similar patterns. For example, Castillo and Cano (2004) surveyed 148 faculty members at a large public research university to explore their job satisfaction and motivation. Faculty members identified recognition, supervision, and interpersonal relationships as the most significant factors that influenced their motivations at work (Castillo & Cano, 2004). Castillo and Cano (2004) also reported that "faculty members were most satisfied with the content of their job and least satisfied with the context in which their job was performed" (p. 72). Female faculty members in particular reported a lower satisfaction rate regarding their working environment (Castillo & Cano, 2004).

Ponjuan et al. (2011) reported a similar pattern in their investigation of untenured faculty members' perceptions of colleague relationships. Over 6,800 faculty members from 80 higher education institutions reported their personal and professional relationships with their colleagues in a national survey (Ponjuan et al., 2011). The findings showed that work relationships directly affect faculty members' performances,

self-esteem, and retention (Ponjuan et al., 2011). Female faculty members also reported less satisfaction regarding relationships at work in Ponjuan et al.'s (2011) study. Similarly, Asian and African American faculty members reported less satisfaction regarding their relationships at work compared to their White counterparts (Ponjuan et al., 2011). These findings in line with SDT studies that reported a higher need of relatedness among underrepresented faculty members at research universities (Lechuga, 2012; Skewes et al., 2017).

As O'Sullivan and Irby (2011) suggested, TPD studies often overlook social interactions in a context, such as peer interactions during TPD and relationships between TPD facilitators and faculty members. TPD should provide faculty members with opportunities to learn emerging technologies for teaching and learning as well as provide a space (either physical or virtual) for faculty members to socialize with their peers and exchange big ideas. Morzinski and Fisher (2002) surveyed 351 faculty members from 37 institutions across the U.S. to investigate the relationships that emerged from faculty members' participation in TPD. Faculty members reported a significant and positive correlation between relationships building and their participation in TPD and reported an average of nine connections or relationships that were developed due to their participation in TPD, particularly with peers, mentors, and TPD facilitators (Morzinski & Fisher, 2002). Over 69% of faculty members valued their TPD connections as important or very important compared to their overall work networks (Morzinski & Fisher, 2002). Morzinski and Fisher (2002) concluded that TPD has the potential to be a critical social space for faculty members' career advancements.

Cook and Marincovich (2010) suggested that TPD at research universities should ensure that they have "faculty-credible" (p. 280) facilitators who share similar educational backgrounds or disciplinary experiences. The similar backgrounds and experiences of the TPD facilitators would help them build professionally trust with faculty members, which is significant in terms of building credibility (Cook & Marincovich, 2010). It is presumptive that trust relationships between TPD facilitators and faculty members would encourage faculty members to openly communicate their concerns and positively interpret suggestions and feedback on their teaching; however, TPD has the potential to strengthen interpersonal and professional relationships for faculty members at research universities and should always take relationship building into account when attempting to increase faculty members' participation in TPD.

Mentoring and Beliefs

Faculty members' pedagogical beliefs related to technology integration are another prevailing challenge for TPD (Kopcha, 2012; Matusovich et al., 2014; Mouza, 2009; Scott & Mouza, 2007). As addressed in the K-12 studies, teachers' pedagogical beliefs have strong impact on their teaching practices related to technology (Ertmer et al., 2012; Ottenbreit-Leftwich et al., 2010). The more sophisticated the teachers' epistemologies, the closer their conceptions are to a student-centered approach (Kim et al., 2013). Similar patterns have been found in higher education studies. For example, a case study at a liberal art college revealed that most of the faculty members believed in a constructivist teaching philosophy instead of a traditional teacher-centered model of teaching (Ferguson, 2004). Also, faculty members who supported a more constructivist pedagogy had a tendency to view technology as a means by which to improve learning

instead of as tools of delivery (Ferguson, 2004). In contrast, negative experiences (both personal and vicarious) related to technology can lead to resistance to technology integration and negative pedagogical beliefs toward technology (Ertmer & Ottenbreit-Leftwich, 2010; Ottenbreit-Leftwich et al., 2010). Therefore, faculty members will be prone to underrate the value of technology in learning enhancement if their pedagogical beliefs are rooted in the traditional model of knowledge transmission from teacher to student or have had a negative experience using technology. Little autonomous motivation will be originated for related TPD when the value of technology in teaching and learning activities is underestimated.

Fathema et al. (2015) evaluated 560 faculty members at two large research universities regarding their uses of LMSs in relation to their beliefs. Faculty members identified three significant factors that could predict their uses of LMSs: perceived self-efficacy, system quality, and facilitating condition (Fathema et al., 2015). To be more specific, faculty members with higher self-efficacy for LMS competence were more likely to perceive LMS as a useful tool and use LMS more in practice (Fathema et al., 2015). Also, system quality, including functions, contents, navigation speed, and user interface, had significant and positive impact on faculty members' beliefs and uses of LMS in practice (Fathema et al., 2015). Finally, facilitating conditions, including technical assistance, individualized consultation, and available training/resources for LMS uses, had a positive impact on faculty members' uses of LMSs. Fathema et al. (2015) concluded that perceived usefulness and perceived ease of use had significant impacts on faculty members' attitudes and beliefs toward LMSs.

Watty et al. (2016) reported similar findings about faculty members' beliefs and their uses of technology in teaching. The authors interviewed 13 accounting faculty members across ten universities to explore their adoption of educational digital tools and accounting-specific technologies in their teaching practices. Faculty members reported a strong resistance to change related to technology integration in accounting education and difficulties being early adopters attempting to push others into embracing the uses of educational technologies (Watty et al., 2016). In line with Ferguson's (2004) and Fathema et al.'s (2015) findings, Watty et al. (2016) reported a significant and negative impact of faculty members' negative beliefs and attitudes toward technology, including perceived ease of use and perceived usefulness, on their adoption and uses of technology in teaching. In addition, Watty et al. (2016) pointed out that faculty members considered time and workload as major barriers of their adoption of educational technologies, which directly related to faculty members' perceived priorities of teaching activities among all responsibilities. This finding is consistent with studies related to the impact of organizational culture, such as a research-driven culture, on faculty members' beliefs and behaviors (Charlier & Lambert, 2020; Miller-Young et al., 2018).

However, it is worth noting that many would assume that the advancement of technology would improve the work efficiency of faculty members and, consequently, reduce faculty workload. However, studies have shown counterintuitive results that have indicated that faculty members who teach with technology often invest more time in planning, developing, and implementing learning activities compared to peers who teach the same courses in F2F format (Chiasson et al., 2016; Phillips et al., 2016; Spector, 2005; Warburton et al., 2002).

National data have shown that faculty members at research universities reported an average of 56 hours of work per week, which is significantly higher than faculty members at other types of institutions (Bland et al., 2006). Faculty members have perceived considerable or extreme external pressures from their heavy workloads (Seaberg, 1998), especially for those faculty members on the tenure track, who experience constant pressure from the ticking tenure clock in terms of time allocation (Rice et al., 2000). The pressure is even worse for female faculty members, who have or are planning to have young children (Fothergill & Feltey, 2003; Ward & Wolf-Wendel, 2004).

As a supporter of the tenure system, Plater (1995) claimed that faculty members' time is the most valuable resource in higher education and institutions must develop a more effective management and evaluation system for allocating resources and faculty time. Baldwin (1998) also expressed his concerns about the negative impacts of technology on faculty workload and pointed out that a supportive professional development system and policies are critical to help faculty members keep up with new technologies. However, time and workload are often identified as major barriers for faculty members' participation in TPD, which indicated perceived lower priorities of teaching activities for faculty members in research universities (Lowenthal et al., 2012; Watty et al., 2016).

Conclusion

This literature review explored the potential of using the self-determination theory (SDT) (Ryan & Deci, 2017) as a guiding framework by which to investigate faculty members' motivations to participate in TPD by reviewing empirical studies using SDT to

examine faculty motivations in different social contexts. Also, guided by an expanded TPD model that was proposed by O'Sullivan and Irby (2011), empirical studies demonstrating TPD in higher education in terms of organizational culture, activities, relationships, and mentoring and beliefs were reviewed. This literature review informed and guided the proposed study the goal of which is to interpret the perceptions of faculty members at research universities regarding their participation in technology-based TPD.

In conclusion, Deci and Ryan (1985a) proposed an organismic perspective of human motivation that suggested that human development involves behavioral regulations within social contexts. This proposal became the fundamental assumption of SDT. The autonomy-control continuum described in the SDT framework indicates that the type of motivation is tied to three basic psychological needs – autonomy competence, and relatedness – that are rooted in the social environment of the individual (Ryan & Deci, 2000a).

Empirical SDT studies have shown the significance of a supportive social environment to satisfy faculty members' psychological needs (Stupnisky et al., 2017, 2018). While autonomy and competence were often perceived as more critical indicators of autonomous motivation in many motivation studies, SDT studies on underrepresented faculty members have indicated that relatedness might play a significant and dominate role in autonomous motivation when faculty members consider themselves marginalized in the social group (Lechuga, 2012, 2014). When autonomous motivation is low, external rewards are often applied to stimulate faculty members' motivation for preferred behaviors. Although classic motivation studies have indicated that external rewards are not an effective method by which to increase autonomous motivation (Deci, 1971, 1975;

Deci & Ryan, 1985a; Ross et al., 1976), more recent studies have found that extrinsic motivation, such as external rewards, could be transformed into more autonomous motivation within a supportive social environment (Bouwma-Gearhart, 2012; Jumonville, 2014). Thus, faculty members might be externally motivated to participate in TPD, but their autonomous motivation will grow if TPD provides a supportive social environment that satisfies their basic psychological needs.

O'Sullivan and Irby (2011) proposed a conceptualized TPD model that emphasized the significance of the social context for TPD. According to the model, activities, organizational cultures, interpersonal relationships, and mentoring are the four social constructs that play important roles in TPD. However, some TPD studies have only focused on technological competence and not included pedagogical discussions in TPD (Dysart & Weckerle, 2015; Herman, 2012; Meyer & Murrell, 2014). Faculty members at research universities also presented inconsistent preferences on TPD formats, which indicates the necessity of a large menu of TPD to satisfy faculty members' demands (Canale et al., 2014; Kinuthia, 2005; Lowenthal et al., 2012; Taylor & McQuiggan, 2008).

Social interactions in TPD contexts have been under-represented in TPD studies (O'Sullivan & Irby, 2011). Positive work relationships are significant to faculty members' job satisfaction and work motivation (Castillo & Cano, 2004), work performance and self-esteem (Ponjuan et al., 2011). Previous studies have shown that TPD has a strong potential in regard to strengthening work relationships for faculty members in higher education (Morzinski & Fisher, 2002). Moreover, studies have shown that faculty members' beliefs and attitudes toward technology significantly impact their

adoption and uses of technology in teaching (Fathema et al., 2015; Ferguson, 2004; Watty et al., 2016). Time and workload are commonly identified as major barriers for faculty members' adoption of technology (Lowenthal et al., 2012; Watty et al., 2016) and studies have indicated that teaching with technology often consumes more faculty time compared to low technology teaching (Chiasson et al., 2016; Tomei, 2006). Although these findings indicated a low perceived priority of TPD for faculty members at research universities, TPD need to provide convenient access for faculty members with busy schedules.

Finally, Baldwin (2005) postulated that the culture at research universities should permeate all aspects of the universities' teaching and learning activities, instead of competing with them. However, faculty members at research universities often consider teaching and research to be fragmented roles in their daily responsibilities (Alpay & Jones, 2011; Miller et al., 2011). One potential solution to strengthening the teaching and research nexus is to implement a Scholarship of Teaching and Learning (SoTL) framework in TPD. SoTL can motivate research-prioritized faculty members to use research to inform their teaching activities or use their teaching roles to strengthen their research activities (Robert & Carlsen, 2017). It is helpful if faculty members adopt the perspective that teaching development is an iterative effort that necessitates continuous learning (Cook & Marincovich, 2010). TPD can help faculty members understand the importance of this perspective by fostering new organizational cultures, which, in turn, will contribute to the development of diversified scholarship on campus.

This literature review identified gaps in the research on faculty motivations related to participating in TPD. Most faculty motivation studies have investigated the

relationship between faculty motivation and career success. However, little research has focused on an in-depth understanding of faculty members' perceptions of their participation in TPD or how faculty members' work environments affect their experiences with TPD. More research is needed to understand faculty perceptions of TPD and identify patterns of faculty members' motivations for their participation in TPD in a research university context.

Table 2.1

SDT Research on Faculty Motivation

Authors	Study Summary
Bouwma-Gearhart (2012)	The study used SDT to investigate motivation for science and engineer faculty members at a research university to initially engaged in TPD. The findings indicated that a major extrinsic motive for faculty members' initial engagement in TPD is a weakened professional ego that disconnect their teaching identities and research identities.
Jumonville (2014)	The study investigated impact of faculty autonomy for faculty members in a private liberal arts university to incorporate information literacy into course design. The findings showed that the negative impact of administrative requirements on faculty motivation could be diminished when supporting faculty autonomy within the confines of the program.
Lechuga (2012)	The study used SDT to understand motivation for 15 Latino faculty members in STEM disciplines to engage in research activities. The findings identified three intrinsic motives: 1) to conduct meaningful research; 2) to produce "high-quality" scholarship; and 3) to feel connected to others.
Lechuga (2014)	The study used SDT to investigate how faculty mentoring practices influence a mentee's intrinsic motivation for scholarly activities. The findings showed four themes for faculty mentees' intrinsic motivation that are affected by the faculty mentoring practices: 1) developing independence; 2) establishing professional identity; 3) negotiating the terrain; and 4) opportunities for non-professional interactions.
Seipel & Larson (2018)	The study used SDT to model the relations between environmental supports and job satisfaction for non-tenure-track faculty members in a large university. The findings indicated that perceived relatedness is the most significant factor in relation to non-tenure-track faculty members' interpretation of environmental supports and evaluation of their job satisfaction.
Skewes et al. (2017)	The study examined and compared methods in which male and female faculty members sought satisfaction for the three basic psychological needs in the promotion and tenure process. The findings showed that male faculty members experienced informational competence whereas female faculty members experienced relational competence in their promotion and tenure process.
Smith et al. (2017)	This study reported an effective design of a gender-diversity program that aims at supporting female faculty members' psychological needs for autonomy, relatedness, and competence. The results showed that both male and female faculty members

	benefited from involvement in the gender-diversity program in terms of satisfying their three basic psychological needs.
Stokowski et al. (2018)	This study investigated work motivation and job satisfaction for faculty members in sport management discipline. The findings showed that faculty members' job satisfaction was significantly positively correlated with identified regulation – an extrinsic type of motivation.
Stupnisky et al. (2017)	This study tested a SDT model to predict untenured faculty members' success in teaching and research. The findings indicated that relatedness is the most significant predictor for faculty members' success in teaching whereas a balanced autonomy and competence satisfaction could predict faculty members' success in research.
Stupnisky et al. (2018)	This study tested a SDT model to predict faculty members' adoption of effective teaching strategies across various higher education institutions. The findings showed that the level of autonomous motivation is significantly positively correlated with faculty members' adoption of effective teaching strategies and no differences found across various types of institutions.
Zaharie & Seeber (2018)	The study investigated the effectiveness of non-monetary rewards in increase faculty members' motivation to engage in journal review activities. The results showed that non-monetary rewards are not effective in motivating faculty members for journal reviewing and, in some cases, even diminish faculty members' intrinsic motivation.

Table 2.2

Empirical Studies of TPD Based on the Four Constructs

Authors	Summary
Organization Culture and SoTL	
Charlier & Lambert (2020)	This study evaluated the long-term effects of a hybrid SoTL program in higher education. The findings indicated that the shared views within the group of faculty members, individual learning differences, interactions of faculty members and the environment, and faculty members' perceptions of their working environment are important factors for a rigorous TPD design.
Miller-Young et al. (2018)	This study investigated the impact of participation in a SoTL program for faculty members in a large research university. The findings showed that faculty members' disciplinary tradition and epistemology caused significant discomforts for their practices and engagement in SoTL activities.
Activities and Tasks	
Herman (2012)	This study investigated the types and frequency of TPD for online education in institutions with an established CTL. The

	findings showed that CTLs offered an average of 15 different types of TPD, and the most common types were LMS resources, technical service, resources for online education, and consultation with instructional designers.
Meyer & Murrell (2014)	This study investigated the content of TPD for online education in 39 higher education institutions in the U.S. The findings showed that the most frequent TPD content includes student assessment, online community, LMS, and instructional design models. And the most frequent formats of TPD are workshops, consultation, short sessions, hands-on training, and online course.
Kinuthia (2005)	This study explored factors that impact the effectiveness of TPD for online education in historically Black colleges and universities (HBCUs). The findings showed that workshops and consultations are the two preferred formats of TPD for faculty members in HBCUs. Faculty member also requested for more trainings on technological competence for web-based tools for online education.
Lowenthal et al. (2012)	This study investigated characteristics of faculty members' participation in TPD across four types of institutions in higher education. The findings showed that faculty members in research universities reported the lowest attendance for TPD, and preferred online TPD and one-hour workshop as the TPD format.
Canale et al. (2014)	This study investigated preferences of TPD formats among faculty members in a large research university. The findings indicated a strong preference on F2F delivery mode for TPD and a desire for workshop and guest speakers for TPD formats.
Taylor and McQuiggan (2008)	This study investigated needs of faculty members in a large research university regarding their participation in TPD. The findings showed that faculty members requested most for self-paced online materials and modules and informal F2F events for their participation in TPD.
Relationships and Networks	
Castillo and Cano (2004)	This study investigated factors that affect faculty members' job satisfaction and motivation in higher education. The findings showed a gender differences regarding faculty members' job satisfaction and indicated that recognition, supervision, and relationships are three significant factors for faculty members' motivation at work.
Ponjuan et al. (2011)	This study investigated untenured faculty members' satisfaction level regarding their relationships at work. The findings indicated the existence of gender and racial gaps in terms of faculty members' satisfaction of relationships at work.
Morzinski and Fisher (2002)	This study investigated the impact of TPD on relationship building for faculty members in higher education. The findings

	showed that faculty members reported a strengthening of collegial relationships with peers, mentors, and TPD facilitators after their participation in TPD programs.
Mentoring and Beliefs	
Ferguson (2004)	This study examined the relationship between faculty members' beliefs about teaching with technology and their teaching practices. The findings revealed that faculty members who supported a more constructivist pedagogy that tends to view technology as a means to improve learning instead of tools of delivery.
Fathema et al. (2015)	This study evaluated faculty members' uses of LMSs in relation to their beliefs. The findings showed that faculty members' perceived self-efficacy, system quality, and facilitation conditions were significant factors to predict faculty members' beliefs and uses of LMSs in practice.
Watty et al. (2016)	This study investigated factors affected accounting faculty members' adoptions of educational digital tools and accounting-specific technologies in their teaching practices. The findings showed that faculty resistance, perceived difficulties of being early adopters, generational attitudes, lack of support, and time/workload were major barriers for accounting professors' adoption of technology in teaching.

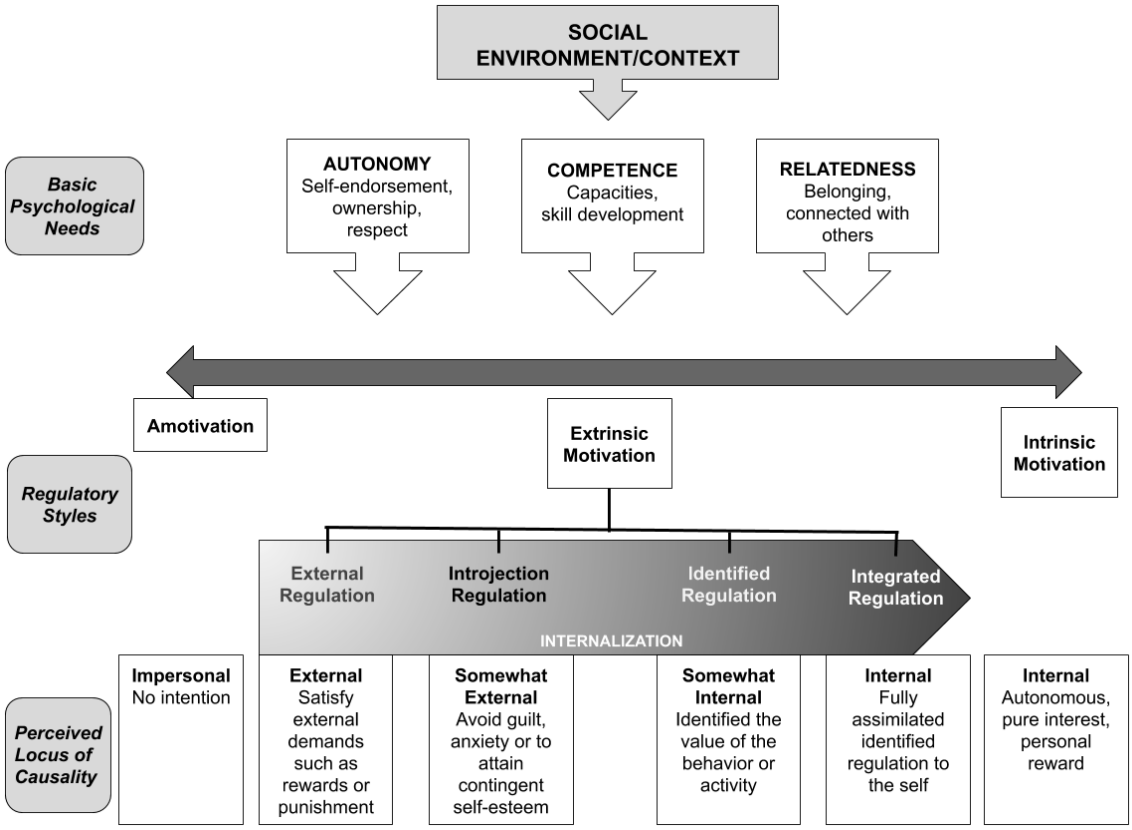


Figure 2.1 *SDT theory motivation continuum. Adapted from "Intrinsic and extrinsic motivations: Classic definitions and new directions," by R. Ryan and E. Deci, 2000, Contemporary Educational Psychology, 25, p. 61. Copyright 2000 by Academic Press.*

CHAPTER 3

METHODS

The purpose of this study is to investigate the perceptions of faculty members at a large college of education (COE) regarding their participation in technology-based teaching professional development (TPD). This chapter first presents and discusses a 2016 exploratory study on the motivation of faculty to volunteer for a peer-led TPD opportunity. The results of the 2016 study informed the design of the dissertation study. Second, this chapter explains the rationale behind using Q methodology as the methodological framework for the dissertation study. Finally, this chapter introduces the design of the dissertation study, including the concourse development, Q sample selection, participant selection and recruitment, pre-sorting survey design, Q-sort results, and post-sorting questionnaire design. The research questions that guided this study are as follows:

1. What are the perceptions of faculty members at research universities toward voluntary technology-based TPD programs?
2. What motivated faculty members at research universities to participate in voluntary technology-based TPD programs?
3. What prevented faculty members at research universities from participating in voluntary technology-based TPD programs?

Exploratory Study

In 2016, I worked as a graduate assistant for the *Innovation in Teaching and Technology* initiative (ITT) in the College of Education. I was responsible for assisting in the preparation and implementation of workshops focused on teaching with technology, as well as consulting with faculty who requested assistance with technology integration in teaching. The conversations among the program leaders about participants' demographics aroused my curiosity regarding the motivation behind faculty members' participation in ITT. Consequently, I interviewed two groups of faculty members to investigate why they decided to participate in ITT or not.

Table 3.1 describes the demographics of the participants in the exploratory study. The first group included seven faculty members who participated in ITT workshops for multiple semesters. I interviewed faculty in the first group about their motivation to participate in ITT, overall experiences with the program, and expectations for future activities. All participants in the first group provided exceedingly positive feedback regarding their experiences in the program. I then raised the question of why other faculty members in the college never chose to attend ITT. Therefore, I conducted a second round of interviews involved another six faculty members who had never participated in ITT. The goal was to understand the reasons or barriers accounting for their lack of participation. I asked the faculty members in the second group about their overall experiences with previous TPD events, perceptions towards TPD, and barriers to participating in TPD.

The interview questions were "open questions" (Roulston, 2010, p. 12) to provide opportunities for faculty to express their voices. I developed interview questions under

the combined guidance of a review of related literature, observations during the ITT events, and conversations with some faculty members (see Appendix A). All interviews were audio-recorded and transcribed with the permission of the participants.

The analysis of interview transcripts used an inductive approach to identify the themes and patterns of faculty members' motivation to participate in the ITT program. The inductive approach allowed "research findings to emerge from the frequent, dominant or significant themes inherent in raw data" (Thomas, 2006, p. 238). Qualitative data analysis software, ATLAS.ti, was used to facilitate the coding process. All transcripts were imported into the software, and the open coding feature was used to develop the codebooks (see Appendix B) and identify the themes for the study.

All transcripts were read closely to gain familiarity with the data before the initial coding phase (Charmaz, 2014). Even though the interview was designed using a semi-structured format, the conversation rarely "follow[ed] up with probes seeking further detail and description about what has been said" (Roulston, 2010, p. 15). This was likely due to my inexperience and nervousness during the interviews. Therefore, all interviews were structured and rigid in their implementation.

The coherent structure of the interviews made it easy to divide the data into segments based on the interview questions. For example, the first interview question was: *How did you hear of ITT for the first time?* Subject 001's response to this question was considered one segment of data, subject 002's response to this question was another segment of data, and so forth. The first two interview transcripts were coded line by line to clarify the participants' implicit actions and meanings (Charmaz, 2014). Based on the codes developed from the first two transcripts, the remainder of the interview transcripts

were coded "segment-by-segment" (Charmaz, 2014, p. 127) to increase the efficiency of the analytical process. I decided to use *in vivo* coding in my analytical process because the participants' language represents certain research university faculty members' characteristics. An *in vivo* coding approach allows researchers to create codes from actual phrases used in each segment of data and preserve the original meaning of the raw data (Thomas, 2006). Table 3.2 presents the iterative progress in the analysis procedure.

Main Themes

Nine themes were identified from the interviews, and the themes from two groups were compared for further discussions. Appendix C provides a detailed description of each theme and related interview quotes. This section includes a summarized report of the findings. First, faculty in the first group had the characteristics of a "growth mindset" (Dweck, 2016, p. 7) and considered TPD to be an effective way of learning. One faculty explained the enjoyment of learning in ITT: "*we learned from each other, as well as from the [workshop] itself*." Faculty members also emphasized the significance of a "*low-pressure*" and "*accepting*" TPD environment, in which "*it's okay if you don't know*." The positive experiences with ITT increased their desire for long-term involvement in the program.

Faculty members commented most often on successful interpersonal relationship-building as one of the positive experiences in ITT. Some faculty members acknowledged that the professional network they established with colleagues and ITT leaders was a strong motivation to continue their participation. It was "*always exciting*" for faculty to meet other people "*that are interested in the same thing*." Faculty members in both groups highlighted the importance of connecting workshop content to their practical

teaching struggles. One faculty member indicated that the best strategy with which to recruit more participants for TPD is to "*figure out how you can solve their problem whatever their problem is.*" However, faculty members also complained that some TPD focused too heavily on technology and ignored the pedagogical issues of technology integration. For many, TPD then felt like a "*technology camp*" that failed to impact their teaching practices.

Also, the financial incentive offered to participate in the workshop was an interesting theme in the data. Most faculty members perceived the small stipend as a "*symbolic*" form of appreciation and compensation for their time and did not consider it a strong motivator. However, all faculty members agreed that the availability of a stipend offered some evidence that the university or the college valued TPD.

Moreover, faculty members in both groups identified time commitment as the top barrier to TPD participation. Faculty members complained about their constant struggle to balance the time invested in research, teaching, service, and other responsibilities. Even faculty members who were highly motivated to attend ITT often wondered "*whether or not I really should go*" because of their busy schedules. The research-driven culture of the university was a significant social factor that influenced how faculty allocated their time. Most faculty members in the study agreed that "*the university really only cares about your publication and grants*" in the promotions and tenure process. *"You could get very quickly to a point where you're getting good teacher evaluations, and then that's an out to get tenure."* Therefore, faculty members are more willing to invest more time in research activities to build a solid research profile and thus to achieve their promotion goals. Coherent with the research-driven culture on campus, faculty also

indicated that teaching-related activities were often not appreciated and recognized at the university and department levels. The fact that TPD is not included in the annual evaluation process signals that *"it's not valued by the college."*

Most faculty members in Group Two expressed their doubts about the effectiveness and importance of TPD because workshops *"would take time away from [their] work,"* especially when they are *"good at teaching [themselves]."* The last identified barrier of TPD participation is negative beliefs about teaching practices with technology. Most faculty members in Group Two agreed that *"technology is a distraction,"* or felt that they were already *"as [digitally] agile as [they] need to be."* Overall, most faculty members in Group Two exhibited a low perceived value of TPD in the interviews. The lack of recognition for TPD participation at the university level reinforced those negative perceptions.

One faculty member in Group One had an intriguing conclusion about TPD participation: "*I think that, often, people that go to these are the ones they're already pretty good at it, and they're interested in it, and they always want to learn more. Sometimes, I think the people who need [TPD] the most are never going to come, because they're not particularly reflective and they don't care about it."*

Impetus for Dissertation Study

The identified themes presented unique views on the part of the faculty regarding their TPD participation, including the perceived value of TPD, the perceived value of technology, the recognition of teaching and TPD, monetary rewards, and TPD as a social experience. Some themes were consistent with the results from previous studies of faculty motivation (see Chapter 2). Direct quotes from the interview transcripts were used

to enrich the development of the sample Q statements for the dissertation study (details will be discussed in a later section). The 2016 study was the starting point of my interest in the topic of faculty motivation and TPD. Valuable lessons were gained regarding qualitative research methods, as well as topic content, during the exploratory study. The findings of the 2016 study also helped in the design of the dissertation study. The following sections describe the research design for the dissertation study.

A Q Methodology Design

This dissertation study used a unique mixed-methods design termed *Q methodology* (often referred to as Q or Q method). Mixed-methods studies usually refer to a rigorous integration of qualitative and quantitative forms of data and techniques in data collection and analysis procedures in response to research questions (Creswell, 2014). Both the Q and mixed-methods communities have recently accepted Q as a mixed-methods methodology, considering that Q consists of both qualitative and quantitative phases (Ramlo & Newman, 2011; Stenner, 2011). However, unlike other mixed-methods designs, Q is far more than "adding a qualitative dimension to a quantitative study or vice versa" (Stenner & Stainton-Rogers, 2004, p. 166). "Describing [Q] merely as mixed methods significantly understates the unique synergy between numbers and narrative within Q" (Rieber, 2020, p. 2530).

The hybridity of the qualitative and the quantitative in Q indicates a mixing of paradigms rather than a mixing of methods (Ramlo, 2016), which does not allow researchers to consider the qualitative and the quantitative as separate segments in a Q study (Brown, 1980). A historical perspective on Q's development helps to explain the

uniqueness of Q as a methodology. Appendix H provides a brief history of Q methodology, including its invention by William Stephenson.

Also, Q, as a mixed-methods methodology that focuses on human subjectivity was criticized by both quantitative and qualitative researchers for its unique philosophical framework. Appendix I synthesized the on-going and controversial debate regarding Q as a scientific approach to investigating human subjectivity.

Q Study Procedures

A typical Q study consists of five phases: concourse development, Q sample development, Q-sorting, Q factor analysis, and factor interpretation (see Figure 3.1). *Concourse* development is a phase that many Q researchers find challenging due to the absence of precise and practical guidance. A *concourse* is a broad range of viewpoints, perceptions, and opinions that could be expressed about the topic investigated in a Q study (Brown, 1980; Stephenson, 1953; Watts & Stenner, 2012). McKeown and Thomas (2013) provided an example of the concourse to the statement "it is raining" to explain the meaning of concourse in practice. The subjective responses to the statement could range from the physical feeling of rain to emotional feelings about rain.

Another example would be movie reviews on the Internet (McKeown & Thomas, 2013). Movie reviews are subjective responses to a movie, including all movie elements, such as plots, values, characters, and even technological design. The concourse includes all subjective and personal responses, which could be positive, negative, or neutral.

Concourse and Sample Development

The volume of a concourse often amounts to many hundreds of statements and is theoretically infinite (McKeown & Thomas, 2013). A researcher is able to gather

subjective expressions from a host of sources, such as daily conversations, interviews, and published commentaries and literature (Brown, 1980). There are practical limits on when to conclude concourse development, such as when no new expressions on the topic can be found (Watts & Stenner, 2012). It is worth noting that researchers must collect expressions of opinions instead of expressions of fact because only the former is the focus of Q (Paige & Morin, 2016).

Researchers must then draw a reasonable number of samples from the concourse to continue the study from a practical perspective. A *Q sample* is a collection of subjective viewpoints drawn from the large concourse. A Q sample represents a balanced selection of potential viewpoints related to the topic of interest (Donner, 2001). Researchers could represent those subjective viewpoints as written statements, photos, audios, videos, or other artifacts with meaning. Having an appropriate set of sample viewpoints covering various standpoints is crucial to ensuring the rigor of a Q study (Coogan & Herrington, 2011). A rigorous and balanced Q sample "will come very close to capturing the full gamut of possible opinions and perspectives" (Watts & Stenner, 2012, p. 58) as to the research question. A balanced Q sample avoids bias towards or against any particular opinion that would affect the analysis results.

Critics have long been concerned about Stephenson's (1953) vague guidance about how to assemble the concourse and sample items. In responses, modern Q scholars have introduced several qualitative techniques, such as interviews, written narratives, nominal groups, and indirect sources, to guide concourse construction (Donner, 2001; McKeown & Thomas, 2013; Watts & Stenner, 2012). Paige and Morin (2016) also

recently introduced a five-step procedure with which develop a balanced and rigorous set of Q sample items.

Q-sort

In Phase Three, researchers need to prepare a Q-sort, which typically includes a sorting grid, Q sample items, and detailed instructions for participants. Q researchers usually accept a quasi-normal distribution design for the sorting grid, similar to a symmetrical bell curve in shape. Figure 3.2 illustrates a typical Q-sort performed using paper-based materials in a face-to-face situation. Fortunately, the availability of software to conduct online Q-sorts has been proliferating in recent years. Interestingly, the influence of the COVID19 global pandemic has influenced even diehard advocates of paper-based Q-sorts to pivot to online Q-sorts using software such as *Lloyd's Q sort tool* (Rieber, 2019), *Easy-HtmlQ* (Banasick, 2015), and *Q Method Software* (Lutfallah & Buchanan, 2019). Researchers who use audio or video files as Q sample items also prefer online Q-sorts over paper-based materials. After the researcher has prepared the Q-sort for administration, participants are then asked to rank-sort all Q sample items on a scale generally ranging from "most like my point of view" to "most unlike my point of view." Therefore, each single complete Q-sort is a data point that represents the participant's subjectivity for Q factor analysis.

Q Factor Analysis and Interpretation

In general, factor analysis is a data-reduction method. The results of the Q analysis are "the grouping of expressed opinion profile[s]" (Valenta & Wigger, 1997, p. 503) based on statistical similarities and differences among the participants (Amin, 2000). Although the development of a Q factor analysis method involves sophisticated

statistics, Q analysis, in practice, requires little statistical background to perform due to the availability of statistical computer software programs like *Ken Q Analysis* (Banasick, 2018). However, the analysis process requires more than simply revealing the clusters of people with similar viewpoints. Q aims to investigate the interdependency of data and generate a holistic understanding of the construction and interrelation of various viewpoints (Brown, 1980; Stephenson, 1953). Thus, researchers must make qualitative decisions regarding which factors are pivotal and should be kept for interpretation based on their prior understanding of the phenomenon, participants, and data. This decision-making process involves abductive reasoning, based on researchers' "hunches" about what occurring in the data (Rieber, 2020).

Deduction, induction, and abduction are three types of logical reasoning in scientific inquiry (qualitative and quantitative) that help researchers "bring a little order to the chaos of the data" (Reichertz, 2007, p. 218). The former two are more familiar to social scientists, while the latter is widely accepted in Grounded Theory studies (Reichertz, 2007) and artificial intelligence development (Staat, 1993). Abduction refers to tentative and dynamic reasoning that "goes backward from a given conclusion to search for the premise" (Walton, 2001, p. 165). Table 3.3 presents a comparison of the logics of abduction, deduction, and induction within scientific inquiry.

Q factor analysis is a technical extension of abductive logic, which aims to detect and create "a surprising empirical fact" (Watts & Stenner, 2012, p. 40). Q's abductive nature is associated with two activities: factor rotation and factor interpretation (Watts & Stenner, 2012). After the production of a correlation matrix, researchers have an opportunity to explore the "abductory possibilities" (Brown, 1980, p. 230) of the data via

factor rotation. Factor rotation allows researchers to observe potential clustering options for data points from different angles in a three-dimensional context without changing the physical position of the data-points on the matrix. Researchers then make intuitive guesses to decide which clustering approach would best explain the data.

Rieber (2020) provided an example to explain abduction in judgmental rotation. A researcher might pick a company's CEO as the rotation focus when the goal was to understand how the company's employees feel about certain policies. However, the researchers could have a hunch about another influential person, such as a senior employee, in the group. Thus, the factor analysis could be rerun to focus on the other influential individual. Abductive logic also plays a significant role in the factor interpretation process (Watts & Stenner, 2012). Modern Q software like Ken-Q typically produces the following files to assist researchers in interpreting the data:

1. Correlation matrix showing correlation coefficients between participants (participants are variables).
2. Factor loading table showing each Q-sort's loading number on every factor.
3. Idealized Q-sort for each factor (an ideal composite of all the Q-sorts loaded on that factor).
4. Factor arrays showing Q-sort values for each statement under each factor (cross-factor matrix).
5. Factor correlation matrix showing correlation coefficients between factors.
6. Flagged Q-sort correlation matrix showing correlation coefficients between Q-sorts under the same factor.
7. Z-scores for each statement under each factor.

Watts and Stenner (2012) asserted that each factor array (Item 4) provides unique patterns that lead to surprising empirical facts. Associated with qualitative traditions, the interpretation of extracted factors cannot occur without researchers' "decision-making based on constant checking and conferring of the quantitative and qualitative data" (Rieber, 2020, p. 2533). Researchers must provide "a best possible theoretical explanation" (Watts & Stenner, 2012, p. 41) to make sense of the configurations present in the factor arrays. Researchers could then share the analysis results with the study participants and conduct post factor analysis interviews. These interviews can be used as supplemental data to validate the findings (Gallagher & Porock, 2010; Watts & Stenner, 2012). The goal of the interpretation is to represent the complex and multifaceted viewpoints of the participants holistically.

Study Design

To ensure this study's rigor, I designed the study following the guidelines provided by Watts and Stenner (2012) and Donner (2001) for multi-participant Q studies. Figure 3.3 illustrates the nine phases of the study: concourse development, Q sample selection, participant recruitment, pre-sorting survey, Q-sorts and after-sorting questionnaire, Q factor analysis, initial interpretation of Q factors, interview, and final interpretation of Q factors.

Participant Selection and Recruitment

The participants in this study were faculty members in a college of education from a southeastern research-I university. It was the same population represented in the 2016 exploratory study discussed above. The participants were selected based on three criteria: (a) employed full-time in the college as faculty members, (b) budgeted at a

minimum of 40% teaching responsibility, and (c) have 3+ years of working experience at the university.

In general, full-time faculty members have more access to campus resources, such as TPD, than part-time or adjunct faculty members in higher education. Adjunct faculty are often marginalized in the institution for a variety of reasons (Tarr, 2010), such as employment policies. The weak connection between the adjunct faculty members and the institution means that the motives and barriers for adjunct faculty members to participate in TPD may be different from those of full-time faculty members. Thus, this study focused on the full-time faculty members in the college to eliminate the influence of certain external factors, such as administrative policy, on faculty's motivation to participate in TPD. The default time budget for tenure track in the college of education is 40% teaching, 40% research, and 20% service. Because the study focused on TPD, it is more purposeful to recruit faculty members who have significant teaching responsibilities. Moreover, faculty members who were new to the university or the college might not have been aware of the TPD opportunities offered to them, because they were busy adapting to the new work environment. Therefore, the second and third criteria helped to avoid issues that were not relevant to motivation.

As presented in Figure 3.3, there were three rounds of participant recruitment for three different activities in the study: (a) pre-sorting survey, (b) Q-sort and a post-sorting survey, and (c) interview. The recruitment for pre-sorting survey participants was aimed at college of education faculty members. The pre-sorting survey included three criteria for participant selection as the first set of survey questions. It worked as a filtering system to exclude faculty who were not qualified to continue participating in the study.

Information such as rank, gender, and ethnicity were saved as part of the data to assist in the interpretation of the Q factors later.

I posted a recruitment announcement for survey participants on a college-wide online announcement system named *COEfyi* for three weeks. At my request, my department chair forwarded the recruitment announcement to other department chairs, along with a request to share the announcement information within their departments. However, none of the two approaches was successful in recruiting a sufficient number of participants. Consequently, I decided to send out individual emails to all college faculty. However, the college administration office could not provide such a faculty mailing list. Consequently, I manually created a directory list so as to include all college faculty members' contact information gathered from their public profiles on the college's directory website.

I then sent an individualized message via email to 204 faculty members to invite them to participate in the study. A link for the pre-sorting survey was included in the recruitment message distributed to these faculty. The survey was open and available for eight weeks. A total of 29 faculty members eventually completed the pre-sorting survey. A total of 24 faculty members also indicated an interest in continued participation in a Q-sort activity.

An individualized recruitment message was then distributed via email to these 24 faculty members to recruit them to participate in the Q-sort activity. The email message included a link to the online Q-sort activity, along with step-by-step instructions on how to complete the Q-sort. Two reminder emails were subsequently distributed to these faculty. A total of 17 participants completed the Q-sort over the course of seven weeks.

All 17 participants were invited to the post-factor analysis interview via individualized emails.

More faculty members were invited to participate in the post-factor analysis interview. The goal was to include some faculty who completed the Q-sort activity and some faculty who did not participate in any stage of this study so far. Recruitment began by inviting all 17 faculty members who completed the Q-sort activity to participate in the interview. I then distributed a recruitment message to all of the college faculty who had not participated in the study–a total of 184 faculty. In the end, a total of twelve faculty accepted the invitation: seven who had participated in the Q-sort activity and five other faculty who had not participated in previous stages of the study. However, one of these five (Participant 19) was an adjunct faculty member who did not match the selection criteria. I was informed of this participant's background during the interview, and it was inappropriate to terminate the interview at the time. Consequently, I decided to exclude the data from this interview for further analysis to maintain the consistency of participant selection. Table 3.4 presents the participants' involvement in various activities.

Concourse and Q Sample Development

This study's concourse included a large variety of subjective responses regarding faculty members' motives, barriers, and perceptions of participating in technology-based TPD. I used written statements to present the subjective responses, believing that writing is the most efficient format in which to communicate complicated topics with faculty participants. I intended to collect as many subjective expressions regarding the research questions as possible in order to develop a well-represented Q sample. The development process involved three sources of subjective statements related to TPD participation:

interview transcripts from the 2016 study, a literature review, and definition statements collected from a pre-sorting survey.

Interview transcripts in the 2016 study were the starting point for the concourse development. I interviewed 13 faculty members about their experiences associated with a technology-based TPD (see the section above entitled "Exploratory Study"). All the statements related to faculty's motives, barriers, and perceptions of participating in TPD were selected and recorded in a Word document (see Appendix D). I used an inductive approach to develop a full list of concourse statements. I grouped quotes into categories and used the codebook from the 2016 study as a reference to create category labels, such as career development, financial incentive, and relationship. I used the same method to categorize statements related to barriers into smaller groups, such as time commitment, commute, and beliefs about PD.

Another source I used to supplement the concourse was peer-reviewed studies of this topic in the literature. For example, Lowenthal et al. (2012) studied the same issue using an online survey (see Appendix E). Dr. Lowenthal kindly shared the survey they used in the study with me and gave me his permission to use it as a resource in my research. I converted some of the survey questions into statements to supplement the concourse. For example, the survey question "*What opportunities and rewards would you like to receive for your participation in professional development activities*?" provides some potential external motives for faculty participation in TPD. The faculty members I interviewed did not discuss some potential motives, such as a promotion or a letter from the dean. The survey content offered a new source to use in developing the concourse. At this point, I had collected hundreds of opinion statements.

Paige and Morin (2016) suggested that researchers start the sampling process when opinion statements collected for the concourse become too cumbersome to manage. I subsequently used a deductive approach to select sample statements. I kept all 18 category labels generated from the earlier step and synthesized some labels into a more general concept. The label number was then reduced to ten. Watts and Stenner (2012) recommended 40 to 80 statements for a standard Q-sort. Given the perceived time constraints of the participating faculty, I decided that a Q sample of approximately 40 statements would be an appropriate upper limit. That means each category need to include no more than four statements. However, it was difficult to maintain the balance in each category. Some categories required more than four statements to capture the diversity of opinions, but other categories could be well represented by less than four statements. Table 3.5 presents the Q statements in development.

In addition, a web-based pre-sorting survey was designed to collect demographic data on the study participants, such as gender, professional rank, and department (see Appendix F). Survey participants were also asked to define TPD in less than 15 words to demonstrate their overarching perspectives on TPD. I used the definition statements that were previously collected to evaluate whether any perspective gaps existed in the developed sample statements. All definition statements were reviewed and recorded in a Word document. I used an inductive approach to highlight keywords in each statement and thus summarize the perspective. The summarized perspectives were then compared with developed sample statements to identify potential gaps. No significant gaps were noted.

As Paige and Morin (2016) suggested, I invited Dr. Rieber as the TPD expert to evaluate the developed Q sample statements. Dr. Rieber examined the readability of the statement from a faculty member's point of view. Paige and Morin (2016), in their guidance on the construction of the Q sample, emphasize that researchers should focus on the readability of statements from the participants' perspective rather than the accuracy of the statements' content. No significant errors were identified in the expert evaluation process, but some minor changes and adjustments were made to increase the readability of the statements. I then finalized the construction of a balanced Q sample. A total of 37 statements were developed as Q sample statements. Table 3.6 presents the final version of the Q sample statements.

Finally, I created a nine-column (-4 to +4) distribution according to Brown's (1980) guidance on a Q grid design for a standard Q-sort. Brown (1980) recommended Q researchers provide a more flattened distribution than the normal distribution observed when participants are considered well-informed about the topic. Brown (1980) explained that more room should be provided in the middle when participants are expected to have no strong opinions on the topic. In contrast, when the grid distribution provides more opportunities for responses at the extremes and less in the middle, participants are forced to make more decisions. As described above, participants in the Q-sort were faculty members in a college of education at a research-I university. I considered these participants as having rich experiences on TPD-related issues. Thus, a flattened distribution was purposely designed to take full advantage of the participants' expertise knowledge on the topic (Watts & Stenner, 2012). Figure 3.4 demonstrates the sorting grid used in the study.

Q-sorts and Post-Sorting Questionnaire

The original proposal for this study included meeting with faculty face-to-face when they completed a paper-based Q-sort. Unfortunately, due to the COVID-19 pandemic in 2020, this was not possible. The university's Institutional Review Board (IRB) required researchers to terminate all in-person research activities to comply with the CDC's health codes. Thus, the design of the Q-sort activity was necessarily changed from paper-based to web-based in order to continue the research without violating any CDC health codes.

A web-based software program, *Easy HTMLQ,* was used to allow participants to perform the Q-sort remotely. Instructions on how to complete the Q-sort were programmed into the software. Appendix G shows step-by-step instructions presented on the webpage for participants. All Q-sort data were automatically transferred into a cloud database, *Firebase,* when participants submitted their Q-sort responses. All data were exported and saved on a local computer drive for data analysis. Participants were asked to record their Q-sort results in a digital spreadsheet as a backup, just in case the cloud database malfunctioned.

The original proposal also included a face-to-face interview with Q-sort participants following their sorting activities to understand their sorting rationales. With restrictions on in-person meetings, a post-sorting questionnaire was embedded in Q-sort as part of the web-based sorting activity. The Q software allowed participants to provide written responses to customized open-ended questions. The interpretation of Q factors benefited from those written responses, grounding the interpretation in raw data.

The open-ended questions on the post-sorting survey are as follows:

1. Please explain why you agree most or least with the following statements you have placed below "+4" or "-4." What are the meanings of those statements for you? Why do you feel so strongly about them?
2. Are there any statements toward the middle of the distribution that play a somewhat pivotal role for you? If so, what do they mean to you?
3. Were there any statements you had difficulty placing? If so, which ones, and why?
4. Do you have any previous experiences with TPD that have significantly shaped your perception about TPD? If so, how?
5. Could you write a short paragraph to describe your overall view of TPD?
6. Are there any issues related to TPD that should be mentioned in the statements but were omitted?

I planned to conduct focus group interviews after the initial interpretation of the Q-sorts. In the latter phases of a study, focus group interviews could effectively examine the findings that emerged from the analysis of other data sets, especially data that have been analyzed quantitatively (Roulston, 2010). However, this plan could not be implemented for various reasons. Detailed descriptions of the survey analysis, Q-sort analysis, interpretation, and post-factor analysis interviews will be introduced in Chapter 4.

Crib Sheet Technique for Q-sort Interpretation

In Q studies, researchers often use the idealized sorts, the related literature, and the researcher's knowledge and insights to interpret each factor (i.e., viewpoint). The goal of the interpretation is to represent the complex and multifaceted viewpoints of the participants holistically. Watts and Stenner (2012) introduced a systematic approach, the

crib sheet technique, to holistically interpreting Q-sort results. Relying on the factor arrays generated by a Q software package, such as Ken-Q, researchers can work through the factor arrays "in order and item by item" (Watts & Stenner, 2012, p. 153). The first draft of the crib sheet includes only four categories:

1. Items ranked highest positively;
2. Items ranked higher in the examined factor array than in other factor arrays;
3. Items ranked lower in the examined factor array than in other factor arrays; and
4. Items ranked highest negatively.

By cross-comparing factor arrays, the researcher is able to "identify items of potential importance ranked towards the middle or zero point of the distribution" (Watts & Stenner, 2012, p. 154). After the first draft of the crib sheet, Watts and Stenner (2012) recommend focusing on the demographic information of participants in order to "identify further items that can help to clarify and/or qualify the account we are building" (p. 157). At this point, researchers may have certain hypotheses to explain the examined factor. The second draft of the crib sheet involves iterative examinations of statements that are not listed on the first draft to identify any statements that support, sustain, or contradict the proposed hypotheses. The researchers can also use the post-sorting interview or written comments that explain the participants' sorting rationales to validate the proposed interpretation. Finally, all the items on the crib sheet will be used to construct a holistic interpretation that captures the viewpoint of the examined factor. Therefore, every factor will be interpreted using the same procedure in order to present the essence of each factor and reduce the possibility of misinterpreting the data (Watts & Stenner, 2012).

Ethical Considerations

This study fulfilled all required protocols requested by the UGA Institutional Review Board. Study participants were well-informed about the research purpose, research procedure, and data storage plan. Though the risks associated with the proposed study were low, participants were free to terminate their participation at any point. All information collected in this study remains confidential, and pseudonyms were used when reporting the results. All collected data are stored on a personal computer, with restricted access limited to the researcher.

Researcher Statement

From a qualitative perspective, researchers are a research instrument in a Q study. Thus, it is vital to identify the personal biases, beliefs, and assumptions that may influence the conducting and conclusions of the study (Maxwell, 2013). It is important to note that I already conducted an exploratory study in 2016 and interviewed some faculty members in a college of education. My Q sample statements' construction and interpretation of the factor analysis results were primarily affected by my experiences with the exploratory study.

As an international student whose native language is not English, I struggled to participate in the traditional style of whole-class discussion during my first few years in graduate school for various reasons, such as the language barrier, a fear of making mistakes, concerns about cultural conflicts and misunderstandings, and an introversive personality. The ideal American style of student in college classrooms is often described as confident, eloquent, a strong leadership, and daring to challenge authority. I grew up in a culture that does not recognize any of those traits as belonging to an ideal student.

Although I was aware of the cultural differences and willing to change, I wish I had been offered alternatives ways to voice my opinions in class discussions, such as using Google Docs or Padlet, as compared to the traditional open-class discussion. Thus, I am personally committed to teaching with technology and highly value the multimodal affordance offered by technology for learners.

Based on my experience in a large research university as a doctoral student, I believe the research-driven culture in research universities drives faculty to prioritize research activities over other tasks, especially for faculty members in STEM disciplines. Although my university promotes teaching with technology on campus, I do not feel those technologies were fully appreciated or well-used to improve the quality of instruction in both undergraduate and graduate-level courses. In my experience, many graduate-level courses were still lecture-dominated or performed using a low-tech approach.

I also worked for three years as a graduate assistant at a peer-led TPD program focused on teaching with technology named Innovation in Teaching and Technology (ITT). At the college administrators' request, a senior faculty member in the college initiated a TPD program in the fall of 2010. I began working for the program in 2014. As a technology supporter, I thoroughly enjoyed working in the program and spent a decent amount of time observing faculty members who participated in the workshops we offered. I noticed that the participants in those workshops were often the same group of people. To confirm my hypothesis, I collected some statistical data from the participant roster. As of the spring of 2016, about 27.3% of college faculty had participated in the program. Among all participants, about 31.5% have participated more than once, which

amounts to 8.6% of the college faculty population. These are adequate numbers for a young and still-growing program. Still, I began to wonder what factors contributed to the differences between those faculty members who chose to participate and those who did not. In other words, why did 8.6% of the college faculty sustain their motivation to participate in the program, and why did the other 72.7% never participate in the program? Thus, I conducted an exploratory study in 2016 to find answers. I interviewed seven faculty members who had participated in the program for at least three semesters and six faculty members who had not participated in the program up to that point. The findings revealed a complex picture of TPD in a research-intensive university.

As an insider of the TPD community, I believe that participating in TPD is a practical and effective approach for faculty members to use in achieving teaching excellence. I also believe that attaining teaching excellence requires continuous learning and development. Although my exploratory study identified several major barriers to faculty members' participation in TPD, such as time, I could not agree with the justification of those barriers from a personal perspective. I did not empathize with faculty members' struggles with time.

Then, in 2017, I began working as a teaching assistant to teach undergraduate-level courses independently. I decided to practice my beliefs regarding TPD and actively participated in many workshops provided by CTL on campus. However, with the responsibilities of teaching multiple sections and conducting personal research activities, I gradually realized the challenges of time management that faculty members described in the exploratory study. Although I highly value my participation in TPD, I found that time, my commute to campus, and other competing responsibilities prevented me from

participating in TPD. I became one of those faculty members who I had disagreed with before! These experiences helped me personally relate to and holistically understand perceptions of faculty members in a college of education regarding their participation in TPD.

I formed trusting relationships with some faculty members in the college of education by offering technical and pedagogical support for their teaching when I worked for ITT. Some faculty participants in this study may have been motivated to participate in the data collection activities due to their familiarity with me and my work. Thus, when they described their TPD experiences and motivation for participating in TPD, they were likely to refer to their experiences with ITT events. Because I only worked for one TPD program – ITT – the majority of my understanding, concerns, and expectations regarding TPD was built on the ITT models. In fact, ITT focuses on technology integration and only offers semester-long workshops for faculty members, and many faculty members expressed a strong preference for the ITT models. Thus, I naturally believe that technology integration should be a must-have component for TPD and that long-term TPD would be more valuable than one-hour TPD. Those beliefs could affect how I interpret faculty members' narrations regarding their TPD experiences.

Table 3.1

Demographics of Participants in the Exploratory Study

Participant	Gender	Race	Rank	Working Years at University	Group No.
001	Female	African American/ Black	Associate Professor	5 +	1
002	Male	Caucasian	Associate Professor	10 +	1
003	Female	Caucasian	Assistant Professor	5 +	1
004	Female	Caucasian	Associate Professor	20+	1
005	Female	Caucasian	Professor	25+	1
006	Female	Caucasian	Assistant Professor	3	1
007	Female	Caucasian	Clinical Associate Professor	10+	1
008	Male	Asian	Associate Professor	10+	2
009	Female	Caucasian	Professor	20+	2
010	Male	Caucasian	Professor	20+	2
011	Female	Caucasian	Professor	3	2
012	Male	Caucasian	Clinical Associate Professor	5+	2
013	Female	African American/ Black	Associate Professor	20+	2

Note: Faculty in group 1 participated in ITT for multiple semesters. Faculty in group 2 never participate in ITT.

Table 3.2

Code Mapping: Iterations of Analysis (to be read from the bottom up)

Research Questions	
RQ#1: Motives for participating?	RQ#2: Barriers to participating?
Third Iteration: Themes	
1A Faculty have a growth mindset	1B Time as the top barrier
2A Positive experiences with TPD	2B Research-driven culture
3A Positive interpersonal relationship established in TPD	3B Lack of recognition for teaching and TPD
4A TPD helped faculty to solve problems	4B Negative beliefs on technology
5A Stipend as an additive incentive	
Second Iteration: Categories	
1A external pressure	1B time commitment
1A desire to grow	1B workload
1A perceived self-competence	1B commute to campus
2A TPD environment	2B perceived university value
2A TPD effectiveness	2B schedule priorities
2A TPD outcomes	2B equality between tenure-line and other faculty
3A peer recommendation	3B recognition for teaching
3A professional network	3B recognition for TPD
3A camaraderie	3B subjectivity in promotion procedure
3A trust	3B perceived value on TPD
	3B low demand
4A solve practical problems	
4A listen to faculty needs	4B perceived technological competence
4A individualized learning	4B technological beliefs
5A stipend as an additional incentive	
5A travel supplement	
5A symbolic appreciation	
5A facilitate tech integration	
First Iteration: Initial Codes	
(due to the length of the table, please refer to Appendix B for initial codes in the first iteration)	
DATA	DATA

Source: Adapted from Anfara Jr., (2008). *Visual data displays* in *The SAGE encyclopedia of qualitative research methods*, Thousand Oaks, CA: SAGE.

Table 3.3

A Comparison of Abduction, Deduction, and Induction

Order of Inquiry	Inference	Process	Relationship to theory
Condition: Having a set of observed facts in a given context and a why- or how-question with no answers.			
First	Abduction	Create tentative and plausible hypotheses to explain the observed facts when no existing rule is appropriate.	Intuitive leap through the creation of new rules driven by the interplay between researchers and data.
Condition: Having a developed hypothesis and use it to examine new cases in question.			
Second	Deduction	Apply already known rules to individual cases to explore consequences.	A top-down movement from existing rules to individual cases.
Condition: Making observations to find connections between a set of facts and another set of facts.			
Third	Induction	Looking across cases to produce a new rule.	A bottom-up movement from individual cases to existing rules.

Note: Table content represents a synthesis of Staat (1993), Walton (2001), and Hansen (2008).

Table 3.4

Participant Involvement in Different Activities

Participant Number	Q-sort	Post-sorting survey	Post-factor analysis interview
1	X	X	X
2	X	X	
3	X	X	
4	X	X	X
5	X		
6	X	X	X
7	X	X	X
8	X	X	X
9	X	X	
10	X	X	
11	X	X	
12	X	X	
13	X	X	
14	X	X	X
15	X	X	
16	X	X	X
17	X	X	
18			X
19			X
20			X
21			X
22			X
23			X

Table 3.5

Q Statements Based on Interview Quotes from the Exploratory Study

Category	Statements based on interview quotes
Growth mindset	1. I attend TPD because I want to improve my teaching practice. 2. I attend TPD because I have to teach online courses. 3. I attend TPD because I enjoy learning. 4. I attend TPD because I want to learn from my colleagues.
Positive experience	5. TPD provides valuable opportunities for me to reflect on my pedagogy. 6. TPD provides valuable opportunities for me to learn innovative ideas. 7. TPD provides a safe environment for me to ask questions. 8. TPD provides a comfortable atmosphere for me to share struggles.
Interpersonal relationship	9. I would attend TPD if a friend recommended it. 10. I would attend TPD if I have a personal connection with the leaders. 11. TPD helps me to build a professional network. 12. TPD creates a community of teaching.
TPD content	13. I prefer TPD connects to practical problems. 14. I prefer TPD provides case studies. 15. I prefer TPD provides on-site support. 16. I prefer TPD allows me to work on my own projects.
Financial incentives	17. I would only attend TPD if a stipend is offered. 18. Offering stipend means university values TPD. 19. Offering stipend means university appreciates faculty time. 20. The stipend can make faculty stay for TPD. 21. I will attend TPD without a stipend.
Time	22. Time is the biggest obstacle for my TPD participation. 23. Commute to campus inhibits my TPD participation.
Research-driven culture	24. Teaching is my priority compared to research. 25. University values research over teaching.
Recognition	26. University values TPD. 27. My department values TPD. 28. TPD is more helpful to younger faculty. 29. TPD should be considered for promotion.
Technological beliefs	30. My teaching is very low-tech. 31. Faculty need to be as digital agile as their students. 32. I can teach myself about technology. 33. Technology improves teaching quality.
Other	34. Food is a good way of attracting faculty to participate in TPD. 35. I prefer the one-hour workshops. 36. I prefer long-term TPD programs. 37. I prefer online TPD.

Table 3.6

Finalized Q Statements

1. I attend TPD because I want to improve my teaching practice.
2. I attend TPD because I have to teach online courses.
3. I attend TPD because I enjoy learning new knowledge.
4. I attend TPD because I want to know what my colleagues are doing.
5. TPD provides valuable opportunities for me to reflect on my pedagogy.
6. TPD provides valuable opportunities for me to learn innovative teaching ideas.
7. TPD provides a safe environment for me to ask questions and share struggles.
8. I would attend TPD if a colleague recommended it.
9. I would attend TPD if I have a personal connection with the presenters.
10. TPD helps me to create a personal professional network.
11. I prefer TPD when it connects to practical teaching challenges.
12. I prefer TPD when it provides case studies or teaching examples.
13. I prefer TPD when it provides on-site technical support.
14. I prefer TPD when it allows me to work on my own teaching projects.
15. I prefer TPD when it introduces technological teaching tools.
16. I prefer TPD when it focuses on my discipline.
17. I prefer TPD when it involves hands-on activities.
18. I prefer TPD when it provides individual feedback on my teaching.
19. I would only attend TPD if a stipend is offered.
20. Offering a stipend can help faculty commit to full participation in a TPD.
21. I would attend TPD even without receiving a stipend.
22. Time is the biggest obstacle for my TPD participation.
23. Commuting to campus interferes with my TPD participation.
24. Teaching is my priority compared to research.
25. My college values TPD.
26. My department values TPD.
27. TPD is most helpful to early career faculty.
28. TPD participation should be considered in regard to promotions.
29. I don’t need TPD because my teaching is very low-tech.
30. Faculty need to be as digitally agile as their students.
31. I can teach myself about technology.
32. Technology improves teaching effectiveness.
33. Integrating technology into teaching increases student engagement.
34. Offering food is a good way of attracting faculty to participate in TPD.
35. I prefer TPD workshops that take no more than 1 hour.
36. I prefer in-depth TPD programs with multiple sessions.
37. I prefer online TPD.

Figure 3.1 *The workflow of a typical Q study*

Figure 3.2 *An illustration of a Q-sorting situation* (Ellingsen et al., 2014)

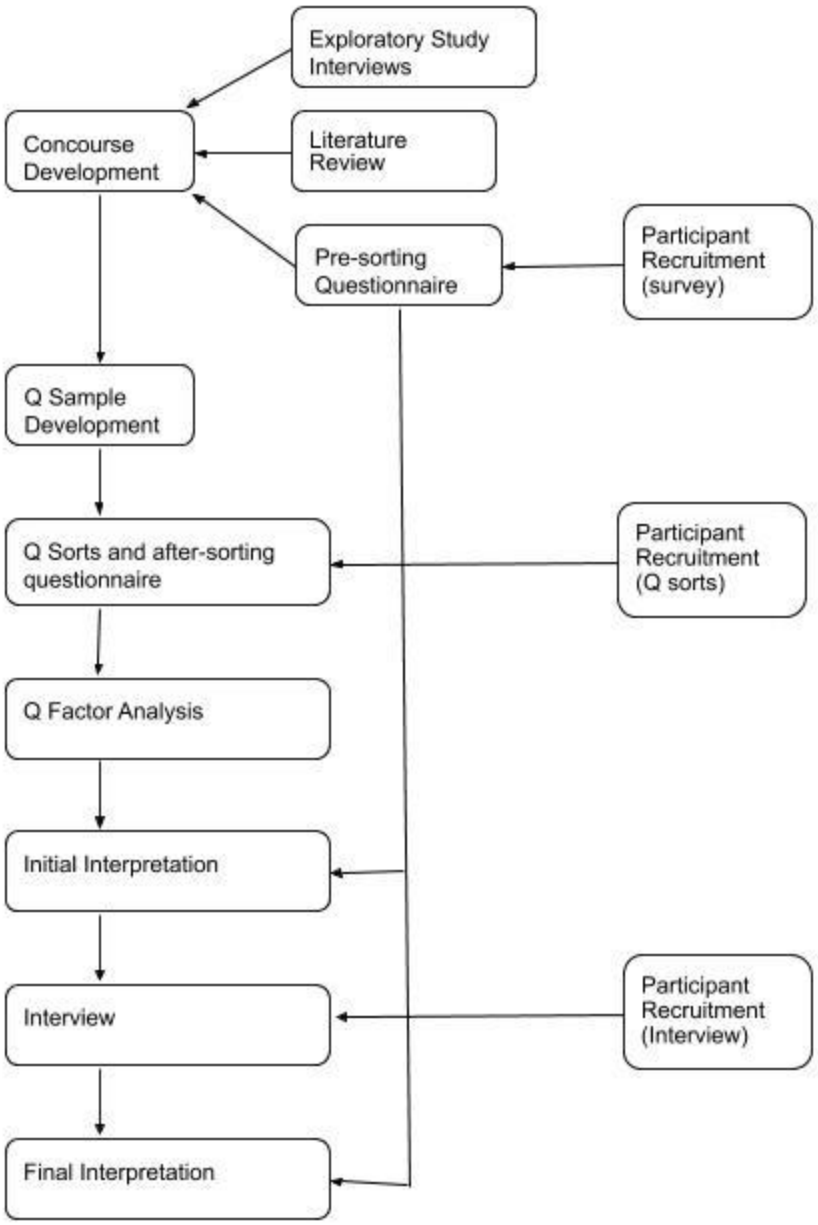


Figure 3.3 *A Visual Presentation of the Study Procedure*

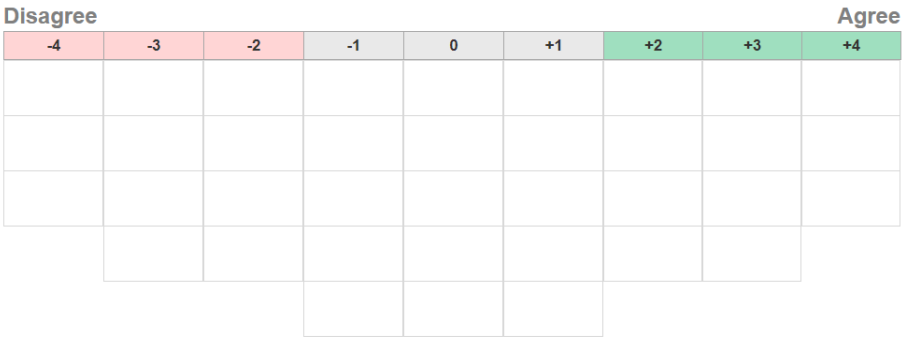


Figure 3.4 *Q-sorting Grid*

CHAPTER 4

RESULTS

This study primarily aims to investigate the perceptions of faculty members at a large college of education (COE) toward their participation in technology-based teaching professional development (TPD). A unique mixed-methods methodology, Q methodology, was used as the methodological framework of this study. Multiple data collection techniques were used and included web-based surveys, Q-sorts, and interviews. A web-based survey was used to collect the participants' demographic data. Then, participants completed a Q-sort comprising of 37 statements to gather participants' subjective opinions towards their participation in TPD. The Q-sort is the principal means of collecting data within Q methodology. Another web-based survey was then used to collect open-ended responses by the participants after they completed Q-sorts. Finally, semi-structured interviews were used to collect participants' feedback on the accuracy of my interpretation of the factor analysis of the Q-sorts.

Two rounds of interpretations were conducted to enhance the validity of interpretations. The initial interpretation was based on Q factor analysis and was shared with the Q-sort participants. The Q-sort participants were then interviewed to provide feedback on the accuracy of the interpretation. Another round of interpretation was based on interview data was then performed to increase the validity of the interpretation results and deepen the understanding of the faculty members' perceptions of the topic. The research questions that guided this study are:

1. What are the perceptions of faculty members at research universities toward voluntary technology-based TPD programs?
2. What motivated faculty members at research universities to participate in voluntary technology-based TPD programs?
3. What prevented faculty members at research universities from participating in voluntary technology-based TPD programs?

Survey Responses

A web-based survey was developed on Qualtrics and used to create an overarching understanding of faculty members in a COE at an R-I university. The first set of four questions in the survey acted as a filter to exclude faculty members who did not meet the participation criteria. The second set of three questions collected the necessary demographic information of the faculty members, including department, rank, and gender. The third set of four questions attempted to gain a primary understanding of faculty members' perceptions of voluntary TPD that focused on teaching with technology.

A total of 29 full-time faculty members from nine departments across the College of Education completed the survey. Table 4.1 shows that the majority of survey participants were tenure-track faculty members. The survey results revealed that 85.7% of the faculty participants believed that all COE faculty members could benefit from participating in TPD. However, only 68.9% of faculty participants claimed they had attended a TPD event within the last year. Table 4.2 shows that 85% of the faculty participants believed that TPD was an effective way to improve teaching efficacy, but 52% of the faculty participants questioned TPD's contribution to students' academic

performance. The faculty participants also held diverse views in terms of building professional networks during their participation in TPD. While 72% of the faculty participants considered TPD was an effective means to meet new people, few were uncertain about TPD's role in building individual relationships or professional networks. In general, faculty participants held a relatively positive attitude towards the value of TPD.

Q-sort distribution

At the end of the survey, 23 faculty members indicated an interest in participating in a web-based Q-sort activity. A recruitment message was then sent to those 23 faculty members via email. The Q literature recommends that the number of Q-sort participants should be at least half of the number of Q statements that are used in the Q-sort (Watts & Stenner, 2012). The number of statements in this Q study was 37. Therefore, the anticipated number of Q-sort participants was about 18. The Q-sort was open to all potential participants for six weeks, and three rounds of reminder emails were sent to participants to encourage their completion of Q-sorts. The final number of faculty participants who completed the Q-sort was 17, which is considered an appropriate number of participants.

Factor Analysis and Initial Interpretation

A web-based Q analysis software package, Ken-Q, was used to analyze the correlations of all Q-sorts. The first step of Q analysis was to correlate the 17 sorts, as shown in Table 4.3. Ken-Q then performed a principal component analysis to predict data variance, as shown in Table 4.4. According to the *Kaiser-Guttman* criterion, eigenvalues

of less than 1.00 are a cut-off point for the extraction of factors (Watts & Stenner, 2012). Therefore, factors 1 to 5 were retained for varimax rotation in the following step.

Results of varimax rotation showed that only one Q-sort loaded in factor 3 and factor 5 respectively. Factors are generally considered significant in Q only when they have two or more significant factor loadings following extraction (Brown, 1980). A manual rotation was performed, but this failed to position two or more significant factor loadings for each factor.

Based on these results, I concluded that too many factors were retained for factor rotation. The analysis was consequently reset in Ken-Q to maintain only four factors for varimax rotation. Table 4.5 shows factor loadings after varimax rotation for four factors. Two or more Q-sorts significantly loaded onto each of the four factors. The four factors explained a total of 64% of the variance in the study. However, Q-sort No. 9 was identified as a confounded Q-sort, which means that the Q-sort significantly loaded on more than one factor. Q-sort No. 9 was then excluded from further analysis, a standard procedure within Q.

After varimax rotation, four factors were retained for further analysis. Table 4.6 shows that none of the factors were significantly correlated. Thus, the retained factors represented four distinguished perspectives towards faculty members' participation in TPD. The demographic data of the Q-sort participants were also used to assist in interpreting each factor.

The majority of Q-sort participants were females (65%) and tenure-track faculty members (65%). Among the 17 Q-sort participants, 71% reported that they had attended at least one TPD event within the last year, and 82% believed that participation in TPD

could benefit all COE faculty members. Almost all Q-sort participants held positive beliefs towards the effectiveness of TPD on teaching efficacy and professional network building, but many were more negatively critical of the benefits of TPD on students' academic performance according to the results of the survey.

Factor 1 Perspective – Continuous Learners Who Enjoy Comprehensive TPD

Factor 1 has an eigenvalue of 6.38 and explains 28% of the variance in the study. Nine participants were significantly associated with this factor. Table 4.7 shows that 67% of the group were tenure-track faculty members. Also, 78% of the group had attended a TPD event within the last year. This group evaluated TPD in the survey as a somewhat to very effective approach to improving teaching efficacy and building professional network. However, only 56% of the group agreed that TPD is effective for improving students' performance. Finally, all participants, except participant No. 5, in the group believed that TPD benefited all COE faculty members. Table 4.8 provides the crib sheet results for the initial interpretation of factor 1.

The mainstream perception in a research-intensive university is that research activities, such as peer-reviewed journal articles and grants, are prioritized. However, *Continuous Learners* indicated that as senior faculty members in the community, they valued teaching over research (24: +3**). *Continuous Learners* were intrinsically motivated to learn innovative teaching ideas to follow the rapidly changing world (6: +4; 3: +3). Professional development and learning were essential values to *Continuous Learners* even though they had many years of teaching experience. *Continuous Learners* recognized the uniqueness of students' generational needs, which required faculty members to enact transformational and innovative teaching. Thus, attending TPD

provided *Continuous Learners* with access to expertise and knowledge that should improve their teaching practices and increase opportunities for them to reflect on their pedagogies (1: +4; 5: +3).

Continuous Learners believed that TPD was well-valued in their work environment and encouraged faculty members at all career stages to participate in TPD (26: +2; 25: +1**). To be more specific, *Continuous Learners* assumed that early-career faculty members typically benefit from participation in TPD the most. However, mid-career and senior faculty members, particularly tenured faculty members, were more likely to be available to explore innovative ideas that could help them to challenge and reflect on their pedagogies that may no longer be relevant (27: -4). Also, TPD offers a great value for *Continuous Learners* to be exposed to ideas across disciplines that could eventually transfer to one's teaching subject while they could maintain trends within the discipline via publications and conferences (16: -3). Another additional benefit of participation in TPD is the expansion of one's professional network across departments and colleges since faculty members tend to be familiar with their colleagues' work within their home departments (10: +2; 4: -1).

A top-down or judgmental manner in TPD could result in a lack of engagement according to *Continuous Learners*. TPD should be a low-risk and low-pressure teaching community that provides a safe space where faculty members can share common challenges and discuss potential solutions (7: +4; 18: -2). Long-term TPD is crucial for the creation of such a community that could help faculty members to connect and identify innovative ideas that could be converted into practice (36: +1**; 35: -3). Busy faculty members might struggle with committing to participation in TPD, but *Continuous*

Learners agreed that adequate time should be invested in TPD in the long run in order for them to implement best practices of teaching (22: -2**). *Continuous Learners* asserted that the face-to-face interactions would be difficult to replicate in an online environment. Therefore, faculty members should not perceive commuting to campus to be an obstacle for participation in TPD in order to gain the benefits of a face-to-face environment (37: -3; 23: -4*).

While *Continuous Learners* may be passionate about teaching, technology is not considered a must-have in their practices. Technology is but one of multiple means that can engage students (33: -1). TPD covers an enormous number of topics, and technology is not and should not be the focus (15: -1; 29: -4). According to *Continuous Learners*, faculty members need to have some digital skills, but this is not a prerequisite to being a good instructor (30: -1). Thus, a focus on technical competence would not be a strong motive for *Continuous Learners* to attend TPD (2: -3; 13: 0*).

Financial rewards and food offerings are nice gestures to include in a TPD event (20: +3; 34: 0). However, they are secondary motivators for *Continuous Learners'* participation in TPD. If a TPD is required for *Continuous Learners'* professional needs, they will be motivated to attend without financial incentives (21: +2).

Factor 2 Perspective – Practitioners who focus on problem-solving

Factor 2 has an eigenvalue of 1.86 and explains 14% of the variance in the study. Three participants were significantly associated with this factor. Table 4.9 shows that all participants in this group were tenure-track faculty members, and 67% of them were male. Only participant No. 12 had attended TPD events within the last year, and none of the rest of the two faculty members had attended TPD within the last three years. This

group agreed that TPD is beneficial to all COE faculty members, but they rated the effectiveness of TPD for improving teaching, improving students' performance, and building professional network from neutral to somewhat effective. Table 4.10 provides the crib sheet results for factor 2.

The practical aspect of TPD was the most valuable trait for *Practitioners*. *Practitioners* preferred TPD sessions that provided hands-on activities and case studies (17: +4**; 6: +4). Therefore, it is significant to *Practitioners* that TPD sessions be contextualized to their disciplines (16: +3) for them to effectively solve the practical teaching challenges they encounter (11: +3).

Practitioners expected to learn technological tools as possible solutions to their everyday challenges (15: +2), but at the same time, they had doubts about the effectiveness of technology regarding teaching and learning (32: 0; 33: 0). *Practitioners* were not early adopters of technology and wanted to invest effort in learning a new technological tool only if the tool had been proven to be effective for teaching (30: -3*; 12: +2). *Practitioners* anticipated structured guidance on uses of technology and the presence of on-site technical support to support them when technical problems arose as they learned new technological tools (13: +2**).

Practitioners used to participated in TPD with a specific and contextualized challenge in mind, but they would not blindly follow an idea unless they determined that the idea could solve their problem (8: 0). The social component embedded in TPD or teaching community building is not considered a significant attraction for *Practitioners* (7: -3; 10: -2*). Intensive working schedules prevented *Practitioners* from being involved in a long-term TPD when their current problems could be solved in other ways (36: -4).

Besides, *Practitioners* assumed that TPD would be most helpful to faculty members in their early careers when they likely encounter the most challenges in teaching (27: +1**). With their problem-oriented mindset, *Practitioners* did not consider financial incentives as relevant to their decision-making regarding participation in TPD (21: +1: 19: -4). To be more specific, if the TPD session does not provide helpful content, a stipend would motivate *Practitioners* neither to participate nor commit to the TPD session (20: 0). Similarly, the offering of food at TPD sessions might be a nice gesture but would not attract *Practitioners* to participate when they lack interest in the topic (34: -3).

Working at a research-intensive university, *Practitioners* value research activities over other tasks, so it should be prioritized by research universities according to them (24: -2). Although participation in TPD may be compromised for other priorities (22: +3), *Practitioners* believed that TPD activities were well recognized at the college and department level since a significant number of TPD events are offered on campus (25: +4**; 26: +3). Moreover, a faculty member could provide a high standard of teaching without any participation in TPD according to *Practitioners*. Thus, *Practitioners* were not convinced that participation in TPD should be included in evaluation for promotion (28: -4**).

Factor 3 Perspective – Networkers who enjoy individualized learning

Factor 3 has an eigenvalue of 1.47 and explained 12% of the variance in the study. Table 4.11 shows background information for the two participants that were significantly associated with factor 3. Both participants had attended at least one TPD event in the last six months. Participant 1 agreed that TPD could benefit all faculty members, but Participant 4 asserted that only faculty members with "*an open orientation*

toward learning" would benefit from TPD. In the survey, both participants evaluated TPD as an effective approach to the improving teaching efficacy and professional network building. Table 4.12 provides the crib sheet results for factor 3.

Networkers recognized TPD's value in providing informative and reflective conversations about pedagogies (6: +2; 5: +1), but the personalized learning functioned as the most important criterion for their participation in TPD. *Networkers* described that an optimal TPD session would allow faculty members to work on their own questions or on a course that they are teaching instead of finding a "cookie-cutter" approach that can apply to all contexts (14: +4**; 16: +3; 11: 0). Although confident in their self-teaching competencies (31: +2), *Networkers* were also interested in exploring peers' creative work (4: +2*; 12: 0). Individualized feedback from peers regarding their current practices and challenges is valuable to *Networkers* (18: +1).

The social connections weighted significantly in *Networkers'* motivation for participation in TPD. When *Networkers* seemed more eager to participate when they were referred by a colleague or personally connected with the presenters (8: +3; 9: +1). *Networkers* valued the trusting relationships with peers that were built through face-to-face participation in TPD, which they felted could not be replicated in a remote format (10: +1; 37: -1).

Technology is insignificant in teaching for *Networkers* because they did not consider technology to be an effective means for engaging students (33: -3**; 32: -3*). However, *Networkers* did not think that the level of technology that was involved in their teaching practices would impact their need for TPD (29: -2). *Networkers* were opposed to

the idea of having TPD focus on delivery methods or tool learning since such systems are constantly changing (2: 0; 17: -1; 13: -4).

Time was *Networkers'* primary obstacle for participation in TPD since they struggled to maintain a work-life balance (22: +3). Thus, lengthy TPD sessions including activities, such as icebreakers, would simply occupy faculty members' valuable time that could be devoted to other priorities (36: -4). TPD should serve as a quick social experience for *Networkers* to catch up on innovative ideas in the field, and faculty members could use conferences and academic journals if they wanted to learn more (35: +4).

If faculty members are encouraged to learn time-consuming and often-changing skills, such as a learning management system, a financial reward would be an effective way to motivate *Networkers* to add more to their already full plate (20: +4; 19: +2**). Time is often strained for *Networkers*, so they would hardly be motivated to participate in TPD without a stipend while they are maintaining a work-life balance (21: -2). *Networkers* also do not perceive TPD as highly valued in their workplaces since TPD never appears on their department agendas or meetings (26: -4; 25: -3). Also, food may not be a good way to attract *Networkers* because offering refreshments, such as snacks, should be a basic fulfillment in any professional event such as TPD in their opinion (34: -1).

Factor 4 perspective – Online Learners Who Look for Professional Recognition

Factor 4 has an eigenvalue of 1.25 and explained 10% of the variance in the study. Table 4.13**Table** shows that two female faculty members were significantly associated with this factor. In the survey, both participants indicated that they had

attended at least one TPD event within the last year. They all agreed that TPD is effective for improving teaching efficacy and could benefit all faculty members. Table 4.14 reports the crib sheet results for factor 4.

Online Learners also highly value the role of technology in teaching practices (32: +1). Although technology is merely a tool to achieve learning objectives, *Online Learners* believed that faculty members would not be able to decide what is the effective tool to use when they are unaware of what is available (29: -4). Current generations of students have generally grown up in a digital environment, and *Online Learners* agreed that faculty members should be familiar with those digital tools in order to increase students' engagement (33: +3*; 30: 0). Thus, *Online Learners* expected to explore and learn about technological tools when they participated in TPD (15: +2). Moreover, with the dramatic increase of information that is available on the Internet, *Online Learners* believed that TPD was an efficient source to learn technology. *Online Learners* did not want to waste significant time learning a new technology on their own; instead, they expected TPD to serve as the resource station for faculty members to quickly pick up prompts, tutorials, and references when they needed to learn about digital tools (31: -4).

Since faculty members are already assessed in multiple ways at work, *Online Learners* saw no value in receiving individual evaluations during participation in TPD (18: -1). Word-of-mouth marketing of TPD could attract faculty participation according to *Online Learners* (8: 0). Compared to interacting with people in the same field, *Online Learners* were more interested in interdisciplinary explorations (16: -3; 4: -1). Instead of focusing on an individual project, *Online Learners* enjoyed collaboration and network building during their participation in TPD (10: +3; 14: -1*). However, their participation

could also be significantly affected by personal connections with the TPD presenters, particularly when the relationship was a negative one (9: -3).

While *Online Learners* personally valued participation in TPD, they did not think that TPD was well recognized in their work environment (25: -3; 26: -1). Financial rewards could be a reasonable compensation for participation in TPD, but being recognized professionally is a more valuable return for *Online Learners'* investment of time and effort (28: +1; 20: -2).

Consensus Perspectives

Statements 2, 5, 6, 11, and 12 were identified as consensus statements, which means they were positioned in similar places on the Q grid across all factors. Those statements indicated viewpoints and opinions that were shared by all Q-sort participants. Table 4.15 presents the factor arrays of consensus statements. The consensus statements suggested that faculty members did not consider teaching online courses as a strong motive for their participation in TPD (2: -3, -2, 0, -2). Instead, faculty members considered that the primary purposes of their participation in TPD were to reflect on their current pedagogy (5: +3, +2, +1, +1) and to learn innovative teaching practices (6: +4, +4, +2, +2). Faculty members also revealed their preference towards learning opportunities for practical demonstrations and ideas that could be easily converted into their teaching (11: +2, +3, 0, +2; 12: +1, +2, 0, +1). It is worth noting that faculty participants performed Q-sorts in April 2020, when the United States was in the early stage of the Covid-19 pandemic. However, the individual interviews with faculty participants were conducted many months later in October 2020. Then, faculty members had experienced over six months of forced remote teaching due to the disruption of

COVID. Therefore, Q-sorts may not accurately reflect faculty members' perceptions towards online teaching after the COVID disruption. Interviews with faculty members significantly enriched the study data and revealed some belief changes among faculty participants. Many faculty members indicated in the interviews that learning best practices of online teaching should be a strong motive for faculty members' participation in TPD during COVID.

Interview Results and Final Interpretation

I shared the initial interpretation of four factor perspectives with all Q-sort participants. I then invited all Q-sort participants to join focus group discussions to share their feedback to ensure the accuracy of the initial interpretation. The original plan was to form four focus groups, and ideally, each focus group would include all participants whose Q-sorts loaded on the same factor. Unfortunately, none of the Q-sort participants indicated an interest in participating in the focus group discussions for various reasons. Consequently, I used an alternative plan to invite all Q-sort participants for individual interviews, and eight out of 17 Q-sort participants honored my invitation.

The interview participants had access to a shared Google Doc document, which included four profile descriptions built on the Q factor analysis results . In the interviews, the participants gave their opinion on the accuracy of each paragraph of the profile description associated with their group. The following overarching questions guided the interviews:

1. Please explain how accurate my interpretation is of your perception of teaching professional development (TPD)?
2. Did I miss anything important regarding your perception of TPD?

3. Do you have any comments that could help me interpret your perception of TPD?

I also expected to learn perspectives from outliers in order to promote diversity and equity in the study. I sent emails to 184 COE faculty members to recruit faculty members who did not participate in any stages of the dissertation study. These faculty members were invited to share feedback on the initial profile descriptions of the four factors. Six faculty members agreed to individual interviews. Outlier participants were asked to skim the four profiles and pick the one that best described them. Outlier participants then responded to the accuracy of each paragraph in the profile description of their choice.

All interview participants were asked to react to a follow-up question if time allowed. The 2016 study found that some COE faculty members claimed that the value and demand for TPD were relatively low because the COE faculty members tend to have strong backgrounds in teaching and education. Participants' responses to this statement will be discussed at the end of each revised profile description.

However, as mentioned in Chapter 3, one faculty member in the outlier group was an adjunct faculty member and did not match the participant selection criteria. I learned about this faculty member's background information during the interview, so I completed the interview but excluded the interview data from further analysis. In total, I transcribed and coded 13 individual interviews to enrich the final interpretations.

All interview transcripts were printed out and color-coded using an inductive approach. I coded the transcripts into groups to gain a consensus interpretation of each perspective. For example, I combined interviews with participants in the factor 1 group in a single Word document. I made notes and annotations on the margin of the papers to

record intuitive understandings of the conversations. The participants responded to the accuracy of each paragraph in the profile description. Therefore, I considered the participant's response to one paragraph as a unit of analysis. For instance, one participant explained their agreement to the first paragraph of factor one profile. That explanation was then considered to be a unit of analysis. Finally, I compared and synthesized coding results, notes, and annotations of the transcripts in the same group to modify or clarify the initial interpretation.

Factor 1 Perspective (revised)—Passionate Learners—"I love learning."

Four participants in the Factor 1 group accepted an individual interview as Table 4.16 presents. All participants agreed and confirmed the majority of the profile description of *Continuous Learners Who Enjoy Comprehensive TPD*, but they also clarified some issues. A major discrepancy was relevant to the definition of comprehensive TPD in the group profile. Therefore, I revised the label of the factor 1 profile to *Passionate Learners* to avoid controversy.

The *Passionate Learners'* prominent characteristic was their intrinsic motivation and passion for learning and exploring innovative ideas in general. Participant 17 asserted her passion on learning, "*I don't need anybody to pay me or to give me a prize or anything like that [to learn]*." Participant 7 confirmed that idea and stated, "*I would [continue learning] until I'm no longer teaching in the university*." Congruent with the initial interpretation, *Passionate Learners* stated their firm beliefs in continuous professional development and life-long learning. Participant 16 explained her understanding of being a COE faculty member:

> *If we're supposed to be preparing teachers and helping them to refine their professional learning networks… you don't know everything you need to know, and you want to continue to educate yourself and participate in programs that support your learning.*

Passionate Learners also appreciated informal learning opportunities in different work settings within and across disciplines, such as department meetings, classes, and professional development. They took every chance to observe and learn from colleagues, staff, and students. Participant 7 introduced an example of informal learning from peers:

> *We're always learning from each other, who are literally within arm's reach. When we sit around a table, and someone says, "No, no, no, you don't have to go through those 15 steps to add an email button to the navbar in eLC, do these three things." Hey, you know, you help me with my productivity.*

Passionate Learners agreed that the presentation of TPD in a mandatory fashion would result in a lack of engagement. According to Participant 16, *"[TPD] should be low risk, low pressure, and self-selected… So, I'm invested in it because I picked it myself… but to allow faculty to self-select, you need a large menu of options, I think, which is a challenge."* But the *Passionate Learners* indicated that they had never been forced to attend a particular type of professional development in their college. However, Participant 17 added that faculty members were asked to complete some appointed workshops about online teaching during COVID.

Interestingly, *Passionate Learners* indicated that they would agree that technology is neither considered a must-have or a prerequisite to be a good instructor before COVID (30: -1). The *human-human contact* instead of technology should be the

core of teaching. Yet, Participant 7 clarified the current dilemma, "*technology is essential for us to even continue [during COVID] ... it's not a prerequisite, but you better be a pretty good, darn good teacher, to be able to teach without any technology*." But in regard to TPD content, *Passionate Learners* agreed that technology is not and should not be the focus. Participant 16 described what she values in TPD:

> *That meeting where people were hashing out issues they have with teaching and learning is so much more important. Because you can learn technology in isolation if you really want to learn it. There are all kinds of tutorials online, or you can just kind of mess around and figure it out. But hashing out teaching and learning problems, I feel like that you need other people's ideas and input and experience, that's harder to find on your own.*

Feedback on the description of financial incentives for participation in TPD was consistent with the initial interpretation. *Passionate Learners* admitted that *money makes a difference* and that a stipend *might be the nudge [they] need to push [them] to sign up for [TPD]*. Participant 8 connected the availability of a stipend to the systematic value and explained, "*a stipend does represent the value of that work by the university or the college or the department.*" However, financial rewards *ought not to be the reason why [faculty members] come to professional development* because *Passionate Learners* are *internally motivated by [the self], intrinsically, not extrinsically.* Participant 17 even argued that based on her past experiences, "*if somebody had to pay me to come, I'd feel like maybe they weren't very good, and their topic was not interesting*."

Passionate Learners also showed disagreement with some of my interpretation. For example, *Passionate Learners* rated Q statement No. 24 significantly higher than did

other groups (24: +3**). But almost all of the participants expressed nervousness with the statement that they value teaching over research in the profile description. Participant 7 explained his concern:

> *I don't know if I value teaching over research, but teaching is highly valued. And when I talk about research, research is up there to inform my teaching. If we're talking about research for the sake of getting grants, I'm not so sure.*

As this quotation shows, *Passionate Learners* recognized the importance of the nexus of teaching and research. *Passionate Learners* clarified that faculty members with different job assignments might not invest equal time and effort in teaching and research activities. So, it may be more acceptable to say *[Passionate Learners] value teaching equally with research,* according to Participant 16. But regardless of assigned responsibilities, *Passionate Learners* perceived that teaching and research activities should be *parts of a whole as opposed to one over the other.*

Passionate Learners then provided diverging feedback to the declaration that TPD is well-valued in their work environment (26: +2; 25: +1**). Participant 8 believed that "*in the College of Education, teaching professional development is definitely valued, and all faculty are encouraged to participate*." However, Participant 17 argued, "*COE has not ever had a lot of professional development.*" She continued by describing overloaded TPD during the COVID era:

> *We've gone from very few to a lot almost within a year's time, and that's an unusual situation ... And now it's like coming at us too fast. And the workload is more right now for lots of reasons. And so, the balance is gone.*

Another objection was related to the commute issue and TPD format. *Passionate Learners* rated statements No. 23 and No. 37 significantly lower than did the other groups (37: -3; 23: -4*). Based on this, I interpreted that *Passionate Learners* did not perceive commuting to campus to be an obstacle for their participation in TPD to benefit from an F2F environment. *Passionate Learners* responded to the two issues in the statement – commute barrier and F2F benefits, with separate reactions. First, *Passionate Learners* were consistently apprehensive about the negative influence of commuting on participation in TPD. Participant 8 described her observations on the commute issue:

> *I do find that those who have a longer commute that I know of in my particular department are not always as present in those professional development opportunities as those who live locally. So, coming to campus, driving fifty-five minutes or more to just attend professional development, from what I see, the folks that show up are most often, they're either teaching that day, so they're on campus, or they're local. If you are an hour away, you're less likely, even with the drive of that face-to-face interaction, even with that motivation… so I do believe that if I were planning a teaching professional development, I would want to look at what are the days that most people are already here on campus and around there.*

But *Passionate Learners* then provided various opinions within the group about the comparison of F2F and online TPD. Participant 7 doubted how often and effectively "*the [current] technology is there to really simulate in its entirety some kind of F2F environment*." Participant 17 admitted that F2F and online interaction "*are not the same exactly. But it doesn't bother me that the fact is I can't see their whole body and read*

how their feet might be twisting, their hands might be twisting or whatever." According to Participant 17, the advantages of the online environment, such as no commute requirement, freedom to pop in and out of a session, and randomized group members for discussion, outweighed attractions of F2F interaction, such as reading body languages.

Additionally, the demands for technical competence training were amplified in the context of COVID. Contradictory to the Q-sort results and initial interpretation, *Passionate Learners* who indicated a different attitude towards TPD sessions only focus on technical competence compared to the Q-sort results (2: -3; 13: 0*). Participant 7 underlined the importance of being aware of available technology: "*because your students are aware of it, your colleagues, your peers, other faculty are using these, and students are coming to expect certain skill levels and certain use of digital tools.*" Technical competence-focused TPD could encourage faculty members to build such an awareness. During COVID, *Passionate Learners* also observed that faculty members who were less tech-savvy signaled a high demand for technical competence training. Participant 8 clarified, "*I believe [for] faculty who recognize that they have gaps in their technological ability, it is a strong motive [to participate in TPD]*."

At the end of the interview, *Passionate Learners* strongly disagreed with the idea that COE faculty members have a low demand for TPD because of their strong background in teaching. *Passionate Learners* largely questioned the causality between being a COE faculty member and being a good teacher. Participant 7 stated, "*university professors are the one group of professionals who are not taught how to teach for the most part*." *Passionate Learners* believed that COE faculty members value TPD more than faculty members in other colleges, even before the pandemic. COE faculty

members' background in education should increase, not decrease their appreciation and demands on TPD. Their life-long learner mindset also reinforced *Passionate Learners'* beliefs regarding the value of TPD for higher education faculty members. Participant 8 emphasized the role of COE in society:

> *If we were teacher educators and researchers in education, and we never looked at our own teaching practices in a reflective manner or considered new and innovative ideas, it just to me would be the antithesis of what a college of education should be doing.*

Factor 2 Perspective—Practitioners who focus on problem-solving.

Unfortunately, although I made multiple efforts to reach out to the three participants in the factor 2 group, none accepted the invitation for an interview. However, three participants in the outlier group identified themselves with the factor 2 profile. Section Outlier Group presents discussions of their perceptions.

Factor 3 Perspective (revised)—Social Learners—"I'm influenced by trusting peers who say that something is worth their time."

Two participants were associated with this perspective, and both accepted the invitation for an interview. Both participants liked the profile name *Networkers who enjoyed individualized learning* and approved of the accuracy of the profile description. In fact, none of the participants proposed any substantial disagreement with any part of the profile description. However, the interview results showed a crucial clarification of the participants' interpretations on phrases like social connections and networkers in the context of TPD. Based on the interview results, I changed the profile name to *Social Learners* as a more accurate descriptor of the factor 3 profile. The interview with

Participant 4 only lasted for about 20 minutes due to her busy schedule. She mainly explained her understanding of the profile name in our limited meeting time.

The most distinctive character of *Social Learners* was the weight they gave to social connections in their motivation for participation in TPD. Consistent with the initial interpretation, *Social Learners* strongly agreed that they would be more likely to participate in a TPD event when they were referred by a colleague, or when they had personal connections with the presenters (8: +3; 9: +1). *Social Learners* heavily relied on an existing trust relationship with peers in the context of professional learning. Participant 4 clarified her trust in peer recommendation: "*I'm influenced by trusting peers who say that something is worth their time*." Participant 1 described her past experiences with peer recommendation:

> *I guess part of that comes from my own experience. If I just show up at professional learning opportunities, often I'm not really interested in them. I don't know why that is. Like why that personal recommendation means so much to me, but it seems to.*

Social Learners also valued and expected to receive peer feedback during TPD attendance. Participant 1 specified, "*I like to have individual feedback from my peers. Because I think that can be constructive to hear from people that are in like the same kind of field that I'm in*." The interactions and connections with trusting peers contributed to a strong motive for *Social Learners'* professional development activities.

However, the differences between social connections and network building in terms of *Social* Learners' understanding need to be clarified. In the context of professional learning, *Social Learners* highly valued trusting peers' opinions. *Social*

Learners usually already had a strong base in some well-maintained networks at work. However, *Social Learners* were less interested in building new networks via TPD, which often required the investment of more time. Participant 4 explained her concerns on networking:

> *At my stage in my career, I'm less interested [in network building]. I have a strong base in networks, and I'm less concerned… Social networking sounds very transactional, like I want to meet people to help me in new places. I don't do it for that reason… I think I did that when I was younger, and I see that as valuable. And sometimes, I think because I am a mother scholar, I don't invest enough energy in that, and therefore, I lose opportunities. Because if you are a good social networker, then people think of your work and help you get different goodies in the academy, different advanced career options, and other awards and things. But I've never been very interested or very good at doing things that way.*

As the above quotation indicates, the term *networker* did not seem to fit the participants' self-description. *Social Learners* highly valued existing relationships at work but were not interested in expanding their professional networks. Related to their attitudes toward social connections, *Social Learners* recognized the challenges that related to creating and maintaining of trusting relationships in an online environment. Participant 1 questioned the effectiveness of relation-building in an online environment:

> *It's hard for me to imagine a situation, where, in a remote format, even with something as advanced as, like Zoom… I just don't think that's possible to read all the body language or to make those kinds of connections, those connections that we can't really replicate in, like in an online format*.

Another significant character of *Social Learners* was prioritizing and following their personal agenda instead of the goals of administrators or TPD instructors. *Social Learners* needed to learn in a context that is related to their personal projects and goals. Participant 1 explained her learning experience with digital tools:

> *I can attend a workshop, and they might expose me to a new tool, but until I've actually practiced it and used it, and applied it in a class that I'm trying to reconstruct for… until I've done that, I don't learn it… I never learned it because I just attended the session.*

Social Learners' explanations and narratives confirmed the initial interpretation of their preferences in terms of individualized learning. Participant 1 critiqued the one-size-fits-all model: "*It's not helpful to have professional learning that's like a blanket that everybody goes through because it might not be appropriate for everyone*." Cookie-cutter types of training did not trigger *Social Learners'* motivation because they prioritized life and work balance over other activities. Participant 4 clarified her priorities:

> *I think that everybody struggles with balance and multiple demands on their time. And I choose to invest as little as I can in things that feel like work… if it feels like I'm doing something just for career advancement or to check off a box, I would rather spend time with my own personal interests and my family and my own academic growth and teaching responsibilities.*

It was also important for *Social Learners* to receive financial compensation to be motivated to participate in any TPD designed to introduce faculty to new teaching platforms or systems identified by the university's administration, such as a learning management system. Participant 4 said, "*If I'm going to have to sit with other faculty and*

not have it personalized and take my valuable time, then I certainly want to be compensated for that time if I'm going to be on another person's schedule for any length of time."

Although *Social Learners* did not feel TPD was highly valued in the workplace, they observed that many COE faculty members engaged in a significant number of TPD events to improve themselves. Participant 1 clarified the differences between the two: "*It's individual pursuits of [TPD] versus it's being something that we should be working together to work out or hold each other accountable for taking part in things that makes sense to us*." *Social Learners* believed that COE faculty members could gain sufficient knowledge about teaching in TPD and that their observations of faculty members' participation in TPD supported the belief that COE faculty members valued TPD.

Factor 4 Perspective (revised) – Tech Lovers – "I have to learn technology."

The label for the factor 4 profile was *Online learners who look for professional recognition* in the initial interpretation. Two participants were significantly associated with factor 4, and both accepted invitations to be interviewed. Although the participants confirmed their passions for and interests in the integration of technology in teaching, they clarified the interest included but was not limited to online learning. Also, the phrase *professional recognition* triggered controversial arguments in the interviews. Thus, I changed the profile name to *Tech Lovers* to clarify the perspective of factor 4.

The *Tech Lovers* showed a preference for online education in the context of TPD and college teaching. Participant 6 advocated for online learning: "*I'm thrilled to be not having to go into a physical, you know, go on campus and meet people. It's never convenient… I would do more of [TPD] if we would move into the 21st century and get*

with the program." Online learning would help connect faculty members and students on branch campuses with the main campus in the opinions of the *Tech Lovers*. Participant 6 expressed concern about the disconnection between the branch and main campuses, "*The branches always feel left out. Our students who take [classes on] the Gwinnett campus, they're not included. Ok, they're like stepchildren*." On the other hand, *Tech Lovers* also explained that online learning was only part of their interest in technology and was not a "deal breaker" for their professional learning. Participant 14 explained her interests in technology:

> *I think that even with the technology that I use with my students, it's not always geared towards online-only experiences… I'm happy to use technology, different applications, or whatever in my own learning, but… I believe that there are some things that are best learned in face-to-face and some things that are best learned using technology*."

Online learning mattered in varying degrees for *Tech Lovers*, but they highlighted the importance of using technology in their teaching, even before the COVID disruption. *Tech Lovers* recognized the students' demands in terms of integrating technology in learning activities. Thus, *Tech Lovers* were willing to invest in learning new technology. Participant 6 shared her commitment to technology:

> *I have to learn technology, even though I get heart palpitations because that's part of the learning process. It's not about what I do. It's how my student is learning, so if my student relies more on technology, well, I better get with the program. It's not about me. It's about them.*

Tech Lovers perceived TPD as a gatekeeper to filter and funnel down useful digital tools from the overwhelming number of available options. However, *Tech Lovers* disagreed with the description of *professional recognition* in the profile description. I personally interpret professional recognition as increasing the weight of participation in TPD in terms of evaluations of promotion, receiving positive reinforcement from colleagues and administration about participation in TPD, or accepting public certification for and acknowledgment of achievement in TPD. Surprisingly, neither participant agreed with my interpretation of *recognition*. Participant 14 interpreted *recognition* as *money as professional recognition,* she further explained:

> *If you meant professional recognition in the sense of being able to show my peers that I've been working on my own development as a teacher, then no, I don't feel that way at all… I wouldn't care if no one knew [about my participation in TPD] as long as I got the money. Well, and that and I learned something.*

Participant 6 clarified that she looks for recognition of her expertise in terms of integration of technology in teaching. Students' endorsement of her teaching and scholarship means much more to her than the acknowledgment of her professional learning by her colleagues. The word *professional recognition* seems like *managing up* to her. She clarified her definition of recognition:

> *I take online [courses] because I want to be really great at what I do and ensuring the success of my students. And I'm hoping that one of these courses will advance me, and I will learn something that will make them successful in their learning. So it's really not my recognition. I want to be professionally recognized for my expertise and all of that.*

This major clarification was significant in providing an accurate understanding of the *Tech Lovers'* mindsets. As *Tech Lovers*, they cared less about how colleagues or administrators responded to their participation in TPD. Instead, the *Tech Lovers* focused on personal gains, either financially or intellectually, from participation in TPD. Compared to their colleagues, students' opinions and demands carried more weight in determining the *Tech Lovers'* behavior.

The *Tech Lovers* also argued that TPD was not highly valued in their work environment. Participant 6 said, "*We just don't talk about it.*" And Participant 14 confirmed, "*It's not nothing, but it's close to almost being nothing. So, it has a minimal impact*." *Tech Lovers* reviewed the disconnection of TPD objectives and the strategic plans of the department. In a comparison to professional development experiences in the corporate setting and experiences with TPD in higher education, Participant 6 was concerned with *sustainable growth* in higher education:

> *We do have a lot of great instructors out there that are doing great things, but when they die tomorrow or get sick, or they leave, is it sustainable? Is it sustained in our institution? Or are we just so individually focused, which we are, that we're not aligning it, you know, with the goals and objectives and achieving the overall goals?*

Participant 6 also critiqued *egocentric and individual-centric* style in higher education: "*If you became too individual and you were not aligning with the culture, the goals, the profit margins, the whatever. You weren't going to do well*."

Worth noting, Participant 14 stressed that financial compensation was a must-have for her participation in TPD. She explained, *"Money would even be above my own*

learning. [laugh] I don't think I would have done [name of a TPD event] if we hadn't gotten money to do it." However, money was necessary but not sufficient to motivate the participant's engagement in TPD. High-quality content that matches her personal interests was also important. Participant 14 further clarified, "*it has to be both because there were definitely some sessions that were offered that I really wasn't interested in. So I didn't do them. So it has to be both… Those two things, I think, are pretty close to equal*." She gave this profile a name: "*Learners who want to get paid*." It was essential to Participant 14 that the time that she invested in TPD was justified by financial compensation. Participant 14 also highlighted that a $500 stipend was probably a balanced amount of compensation to motivate faculty members but prevented participation only for money. She described her rationale for offering a $500 stipend for participation in TPD:

> *I think that the university or the college did a good job of giving just enough incentives to hopefully only get people to participate who were actually interested in it because it's, it's not too much money… If they had made it like a thousand, I think that more people would do it, and they would also probably not be that interested in the topic.*

Although there were various motivators for the *Tech Lovers'* participation in TPD, they shared a strong interest in the integration of technology and agreement that TPD was a valuable resource for the learning of technology. In addition to their personal pursuits of the integration of technology, students' learning was the core of *Tech Lovers'* motivation for their participation in TPD.

Outlier Group

Q-sort participants provided valuable feedback on the accuracy of my initial interpretation in order to improve the study's rigor. However, it is also important to increase the diversity and equity of the study. In the pursuit of social justice to offer opportunities for faculty members who did not participate in the Q-sort activity to voice their opinions, I invited all faculty members in the college of education to provide their feedback on my initial interpretation. Thus, faculty members who did not complete the Q-sort activity but completed the individual interviews were grouped as the outliers.

Five faculty members in the outlier group accepted the interview invitation. None of the participants in the outlier group participated in previous data collection activities, such as the survey or Q-sort. Outlier participants self-selected a perspective profile from the initial interpretation that best described their perceptions of participation in TPD. Table 4.17 shows the results of the outlier participants' profile selection.

Participants 18, 21, and 23 – Factor 2 Perspective (revised) – Problem-oriented Learners

Participants 18, 21, and 23 indicated a strong association with the factor 2 profile: *Practitioners focus on problem-solving*. Since none of the Q-sort participants in the factor 2 group provided feedback on the initial interpretation, I used the interview data that were collected from Participants 18, 21, and 23 to supplement the interpretation. Based on the interview results, I revised the profile name of the factor 2 perspective to *Problem-oriented Learners.* The phrases *practical* and *problem-solving* were critical in order to describe the *Problem-oriented Learners'* motivation for participation in TPD. Participant 21 stated her major motivation for participation in TPD:

I'm only going to go if [TPD] helps me address a challenge I'm having or need I have... If I don't have that need, you could pay me five hundred bucks, but I can probably find something better to do with that time because I have other needs."

Particularly during the COVID disruption, the hands-on and practical component of TPD was crucial for *Problem-oriented Learners*. Participant 18 explained, "*Like right now, hands-on is very valuable to me. If I have to use some of these new tools that we're using in order to connect with our students, hands-on helps me very, very much*". *Problem-oriented Learners* did not present any preference regarding TPD (e.g., domain-specific) or content (e.g., innovative teaching ideas). The *Problem-oriented Learners* only wanted help from TPD with *finding effective solutions for practical challenges that [they are] encountering*.

Based on their problem-oriented mindsets, *Problem-oriented Learners* expected to see scholarly evidence of effectiveness when an idea was introduced in TPD. Participant 18 emphasized the importance of scholarly evidence: "*I want evidence to know that it's going to work. I want to know that it's going to be effective.*" In general, *Problem-oriented Learners* were not early adopters of digital tools, but they were willing to invest effort and time to learn a new tool *if it works*. *Problem-oriented Learners* were not interested in *[doing] technology just for the sake of technology*. Therefore, *Problem-oriented Learners* would not attend TPD to catch up on an innovative concept but would only engage in *needs-based* solutions.

Consistent with their problem-oriented philosophy, *Problem-oriented Learners* confirmed that financial incentives generally do not make a difference regarding their participation in TPD. A stipend often did not equal faculty members' investment of time

in TPD. However, Participant 23 clarified, "*if it's 25K and it's going to cover the better part of an international trip, then I might go sit through something*." Besides, *Problem-oriented Learners* pointed out that continuing education might be part of the licensure requirement in some disciplines, so the financial incentive of participation in TPD was built-in in the promotion structure for faculty members.

Recognizing and rewarding participation in TPD at the local level was more significant than at the college or university level based on the opinions of the *Problem-oriented Learners*. Participant 21 highlighted, "*If our department head and dean values something, then faculty will be more likely to do it*." Thus, discussing TPD values at a college or university scale was less meaningful to *Problem-oriented Learners*, but they believed that TPD was well valued in the university system.

Problem-oriented Learners had disagreements within the group about descriptions regarding the *teaching community*. Participant 23 confirmed the profile description and stated that he was not interested in being involved in teaching communities:

> *I'm fairly independent in my approach to instruction and teaching, and I don't feel like I need to talk about it a whole lot with other people. I don't feel like I need a whole lot of support from other people to do that and do it fairly well… In general, I don't have a strong need to socialize and be a part of a group when it comes to teaching.*

Participant 23 also asserted that he had not experienced any struggles or challenges that might lead him to want to join a teaching community. He further explained, "*I can't think of situations where I had like a whole class that things weren't going well with. It's*

usually more and more individual basis." If networking were the goal, Participant 23 stated, "*I would tend to do something research-related, and I would be looking in that arena*." Participant 23 believed that interacting with students would be a more effective approach to improving teaching practices than talking to a group of colleagues.

In contrast, Participant 18 expressed the necessity of a teaching community and shared her positive experiences with a structured teaching community during the COVID disruption. Participant 18 explained, "*I'd like to have people that I can turn to and talk about, you know, even if it's just sharing, 'oh, gosh, this is a challenge, how are you approaching it?*'" In conclusion, a teaching community would not be a significant attraction for *Problem-oriented Learners*, but they could *benefit from the community that's there* through participation in TPD.

Three participants in the *Problem-oriented Learners* group also provided distinct opinions in their answers to the follow-up question about low TPD demands among COE faculty members. Participant 23 indicated agreement by clarifying that "*there certainly is plenty of opportunity for [TPD]… But I don't see a lot of people participating; I don't hear of them participating a lot. I don't participate*." However, the other two participants argued and questioned if any faculty members *would say that to their students and alumni.* Participant 18 argued, "g*reat teachers are teachers that continue to learn how to teach*." Students' needs are changing, and the best way to teach is also changing. Participant 18 continued, "*I think if you say that, then you are already limiting where you could go or what you could learn or what you could do*."

Since outlier participants did not complete Q-sort, it was not surprising to see conflicting opinions within the group, although all three participants self-associated with

the factor 2 perspective. However, the most distinct characteristic of *Problem-oriented Learners* was their problem-solving mindset, which was confirmed and agreed upon by all three participants. This characteristic paralleled the initial interpretation.

Participant 20 – A wrestle between personal interests and systematic values

Participant 20 was an early career faculty member who went through the promotion and tenure process not long before the interview. She showed a strong interest in the study and walked me through all four profiles from her point of view. But she primarily resonated with the factor 1 perspective and indicated a similar passion for learning innovative ideas as the others in the factor 1 group. "*I'm always searching for ways to improve not only my materials but also the discussions that go along with the materials and the activities that I design*." She did not indicate any disagreement with any descriptions of the factor 1 perspective.

She then talked about the potential motivation for participation in TPD as a practitioner as described in the factor 2 perspective:

> *I, too, would like something that feels like it's more tailored to domain-specific… I don't have a whole lot of time. I don't know if it's the best thing that I should go to. A comprehensive situation where maybe nothing is useful, or maybe only one thing is useful. If I know that this other PD experience is very tailored to what I do already, then maybe that's where I should spend my time. So I might be more likely to choose something that appears as though it's more relevant because of time constraints.*"

She explained her challenge to maintain the work and life balance as a mother scholar with a young baby. Time was portrayed as the factor that decided which type of TPD she would attend.

Intriguingly, she wished to be a factor 3 type of person after becoming tenured, but she currently did not perceive herself as belonging in this profile. She explained that her busy schedule also limited her availability for network-building opportunities, but she looked forward to becoming a *networker*:

> *I feel like that should be who I am. I should be like [that]. It might be helpful to network and to build relationships within my institutions; that might be an approach that would be beneficial. Because it's never a bad thing to network and to meet people and to grow your connections.*

Finally, she suggested that experiences during the COVID era have changed her attitudes towards online learning to be more positive since "*everything is online now*." But technology remains unappealing to her. Her work experiences with elementary teachers caused her to believe that "*hands-on manipulatives are often more appropriate [in supporting student learning]*." Therefore, she did not perceive herself as fitting into the factor 4 profile.

However, the most important message in her case was a constant struggle between her personal pursuit of teaching excellence and a perceived systematic value on research productivity. She was told explicitly "*to stop spending time on my teaching*" by senior faculty members in the department, including "*people in powerful positions*." As an early career faculty member, her interest in teaching was diminished by the influences of the priority of research at the university and in her department:

> *Sometimes it feels like I don't have a voice, and I don't have the freedom to have a voice. It feels like if I say or do the wrong thing, perhaps, I will have trouble later on. Because you do have to, as a junior faculty member, you rely on your colleagues to… They have to vote on your case. So if you say or do the wrong thing, sometimes it feels like that could adversely affect my success in this system.*

She questioned whether all faculty members need to be the same type of researcher because "*I combine my research and my teaching*." With 40% of her time budgeted for instruction, she believed that the effort that she invested into teaching excellence was not equally valued as research. She is passionate about teaching-related professional learning and believes that "*there's always areas to improve [in teaching]*." But she has to make compromises in order to devote more attention to more highly valued activities like research within a broader scale system. She concluded, "*I'm trying to do everything that I think the system values*."

Participant 22 - I can teach online but not learn online.

Participant 22 was a tenured faculty member who associated himself with the factor 3 profile. He considered "*teaching is relationship building*" and enjoyed collaborative work with colleagues in different projects, including but not limited to teaching. "*Doing that [project] collaboratively is much more interesting than sitting in a room trying to imagine that by yourself*." He used a religious retreat as an analogy to describe his ideal participation in TPD.

> *So a PD would be a retreat for me. And the nice thing about the retreat environment is, again, ideally, you're in a beautiful space, authentic, bucolic, and wooded or whatever. And you're with people you have to work with for part of it,*

> *and then you're able to do individual work for part of it as well. And then there's a social aspect at the end that you can choose to engage in or not.*

The advantage of a situational retreat setting for TPD, in his opinion, was: "*It's not just strictly work, but also it's a place you can't escape*." This break from the comfort zone meant a *mind shift* that could help him to concentrate on what is happening in the physical environment.

His strong preference for the retreat environment explained his strong resistance to online TPD. Even though he had led online PDs due to COVID influences, his opinions toward online learning remained unchanged. The affection, emotion, *smells and sounds, and touch* in a F2F environment would not go through computers, according to him:

> *I like to be in a room with people and read their reactions. A lot harder to do that when you've got for me, at least when you've got 70 boxes of faces, you know, got to figure out like what's going on there. I've administered a two-day online PD. I don't know that I would want to sit through one. In fact, I think I would absolutely, totally not ever want to sit there.*

However, although he enjoyed relationship-building activities, such as icebreakers, he admitted that he had "*a hard time dedicating an extended period of time, not doing the thing*" at his current career stage. He now prefers TPD that is quick and straightforward, although that approach runs counter to his ideal TPD in a retreat situation. He suggested, "*when we were doing the work as it's happening, the relationships are built-in… because that content is so valuable, that takes care of that relationship building role*."

Finally, he agreed with the idea that COE faculty members have a low demand for TPD due to their backgrounds in education. He pointed out that TPD at the university level often was "*for people who have never taught before*." Those TPD sessions were valuable from "*a really basic standpoint*." COE faculty members, however, often "*have experiences in the classroom*." Though it might not mean COE faculty members were all good at teaching, "*in the aggregate, the COE professoriate is probably better at teaching than most colleges*."

Summary

This chapter presented statistic results of Q-sorts and qualitative interpretation of Q factors to provide a holistic understanding of perceptions of faculty members in research universities regarding their participation in TPD. The initial interpretation of Q-sorts identified four distinct viewpoints regarding faculty members' perceptions of TPD: 1) continuous learners who enjoy comprehensive TPD; 2) Practitioners who focus on problem-solving; 3) Networkers who enjoy individualized learning; and 4) online learners who look for professional recognition. However, faculty members provided detailed clarifications for the initial interpretation of data in the interviews. The second round of interpretation clarified and modified various misinterpretations of faculty members' viewpoints. The finalized viewpoints were identified as: 1) Passionate Learners; 2) Problem-oriented Learners; 3) Social Learners; and 4) Tech Lovers. In addition to the four distinct viewpoints, second round of interpretation also identified two individual cases of faculty members as 1) A wrestle between personal interests and systematic values; and 2) I can teach online but not learn online. This study's findings contributed to existing literature of TPD studies and faculty motivation.

Table 4.1

Demographics of the Survey Participants

Gender	Counts	Percentage
Male	12	41.40%
Female	17	58.60%
Transgender	0	
Genderqueer/ Gender non-conforming	0	
Professional Rank		
Professor (tenure-track)	10	34.50%
Associate Professor (tenure-track)	10	34.50%
Assistant Professor (tenure-track)	2	6.90%
Clinical Professor	1	3.40%
Clinical Associate Professor	3	10.30%
Clinical Assistant Professor	1	3.40%
Lecturer	2	6.90%
Instructor	0	
Department		
Career and Information Studies	5	17.2%
Communication Sciences and Special Education	4	13.8%
Counseling and Human Development Services	2	6.9%
Educational Psychology	1	3.4%
Educational Theory and Practice	2	6.9%
Kinesiology	3	10.3%
Language and Literacy Education	4	13.8%
Lifelong Education, Administration, and Policy	5	17.2%
Mathematics and Science Education	3	10.3%
Total	**29**	

Table 4.2

Perceived Effectiveness of TPD

	Not Effective	Somewhat Ineffective	Neutral	Somewhat Effective	Very Effective	Total
Improving teaching efficacy			4	19	3	26
Improving students' academic performance	1		12	9	3	25
Building professional network	1		6	13	5	25

Table 4.3

Correlations Between Q-sorts

P No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	100	29	42	30	42	17	24	36	33	26	10	27	11	35	35	29	15
2	29	100	64	15	50	25	52	63	59	37	19	49	20	36	63	64	40
3	42	64	100	4	29	31	45	54	40	33	19	36	10	40	59	25	20
4	30	15	4	100	17	7	17	18	44	10	-9	27	11	20	31	10	2
5	42	50	29	17	100	18	33	40	28	43	-5	32	10	38	40	43	9
6	17	25	31	7	18	100	30	39	17	-5	6	34	13	50	28	33	30
7	24	52	45	-7	33	30	100	49	51	42	19	52	32	52	52	67	47
8	36	63	54	18	40	39	49	100	52	44	6	40	7	41	50	59	44
9	33	59	40	44	28	17	51	52	100	35	30	60	31	53	67	39	41
10	26	37	33	10	43	-5	42	44	35	100	22	9	-7	20	40	30	24
11	10	19	19	-9	-5	6	19	6	30	22	100	40	23	3	23	24	6
12	27	49	36	27	32	34	52	40	60	9	40	100	38	42	47	37	42
13	11	20	10	11	10	13	32	7	31	-7	23	38	100	20	20	20	30
14	35	36	40	20	38	50	52	41	53	20	3	42	20	100	40	45	28
15	35	63	59	31	40	28	52	50	67	40	23	47	20	40	100	35	39
16	29	64	25	10	43	33	67	59	39	30	24	37	20	45	35	100	46
17	15	40	20	2	9	30	47	44	41	24	6	42	30	28	39	46	100

Table 4.4

Unrotated Factor Matrix

Participant	Factor Number							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	0.50	-0.40	0.20	0.12	0.27	0.22	0.02	0.60
2	0.81	-0.02	-0.07	0.15	0.17	-0.12	-0.15	-0.30
3	0.67	-0.12	0.00	0.03	0.38	-0.48	0.30	0.03
4	0.24	-0.42	0.75	0.07	-0.32	0.04	-0.15	-0.07
5	0.56	-0.45	-0.12	0.02	0.17	0.46	0.01	-0.29
6	0.45	-0.03	-0.07	0.79	-0.18	-0.20	-0.02	-0.11
7	0.76	0.25	-0.35	0.04	-0.02	0.10	0.18	0.08
8	0.77	-0.16	-0.16	0.03	-0.05	-0.20	-0.22	-0.02
9	0.77	0.09	0.38	0.22	-0.13	0.01	0.00	-0.01
10	0.48	-0.45	-0.32	0.49	-0.08	-0.04	0.04	0.09
11	0.25	0.56	0.32	0.10	0.57	0.08	-0.23	0.06
12	0.69	0.32	0.33	0.09	-0.05	0.16	-0.04	-0.09
13	0.27	0.70	0.08	0.34	-0.18	0.10	0.31	0.00
14	0.66	-0.04	0.04	0.34	-0.24	0.20	0.46	0.02
15	0.77	-0.06	0.21	0.17	0.06	-0.25	0.06	-0.08
16	0.71	0.15	-0.41	0.09	0.04	0.31	-0.27	-0.02
17	0.57	0.28	-0.17	0.03	-0.45	-0.16	-0.34	0.30
Eigenvalues	6.38	1.86	1.47	1.25	1.06	0.85	0.77	0.67
% Explained Variance	38	11	9	7	6	5	5	4
Cumulative % Explained Variance	38	49	58	65	71	76	81	85

Note. All numbers were rounded to two decimal places.

Table 4.5

Rotated Factor Loadings

Participant Number	Factor 1	Factor 2	Factor 3	Factor 4
10	**0.77**	-0.27	0.15	-0.31
7	**0.75**	0.36	-0.16	0.21
2	**0.74**	0.26	0.22	0.12
8	**0.72**	0.07	0.19	0.27
16	**0.72**	0.22	-0.19	0.32
5	**0.61**	-0.23	0.30	0.16
15	**0.60**	0.32	0.46	0.08
3	**0.56**	0.13	0.26	0.24
17	**0.50**	0.38	-0.09	0.15
13	0.15	**0.76**	-0.16	-0.24
11	-0.07	**0.67**	0.06	0.17
12	0.33	**0.63**	0.33	0.30
4	-0.05	0.00	**0.89**	-0.01
9	0.51	0.51	0.53	0.02
1	0.36	-0.10	**0.50**	0.26
6	0.18	0.02	0.03	**0.89**
14	0.44	0.17	0.23	**0.53**
% Explained Variance	28	14	12	10

Note. All numbers were rounded to two decimal places.

Table 4.6

Factor Score Correlations

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.00	0.33	0.15	0.39
Factor 2	0.33	1.00	0.00	0.10
Factor 3	0.15	0.00	1.00	0.12
Factor 4	0.39	0.10	0.12	1.00

Note. All numbers were rounded to two decimal places.

Table 4.7

Factor 1: Participants' Background Information

P No.	Gender	Professional Rank	Department	Sorts Weight within the Factor	Follow-up Interview
10	M	Associate Professor	Math & Science Ed	10	
7	M	Professor	Career & Information Studies	9.25	X
2	F	Professor	Lifelong Education, Administration, & Policy	8.92	
8	F	Clinical Associate Professor	Communication Sciences and Special Education	8.15	X
16	F	Lecturer	Career & Information Studies	7.88	X
5	M	Associate Professor	Career & Information Studies	5.14	
15	F	Professor	Career & Information Studies	4.98	
3	F	Clinical Professor	Language and Literacy Education	4.45	
17	F	Professor	Language and Literacy Education	3.6	X

Table 4.8

Factor Interpretation Crib Sheet for Factor 1

Items Ranked at +4
1. I attend TPD because I want to improve my teaching practice. +4
6. TPD provides valuable opportunities for me to learn innovative teaching ideas. +4
7. TPD provides a safe environment for me to ask questions and share struggles. +4
Items Ranked Higher in the Factor 1 Array than in other Factor Arrays
5. TPD provides valuable opportunities for me to reflect on my pedagogy. +3
24. Teaching is my priority compared to research. +3 **
21. I would attend TPD even without receiving a stipend. +2
36. I prefer in-depth TPD programs with multiple sessions. +1 **
34. Offering food is a good way of attracting faculty members to participate in TPD. 0
Items Ranked Lower in the Factor 1 Array than in other Factor Arrays
4. I attend TPD because I want to know what my colleagues are doing. -1
15. I prefer TPD when it introduces technological teaching tools. -1
22. Time is the biggest obstacle to my participation in TPD. -2 **

37. I prefer online TPD. -2
18. I prefer TPD when it provides individual feedback on my teaching. -2
2. I attend TPD because I have to teach online courses. -3
35. I prefer TPD workshops that take no more than 1 hour. -3
16. I prefer TPD when it focuses on my discipline. -3

Items Ranked at -4

23. Commuting to campus interferes with my participation in TPD. -4 *
27. TPD is most helpful to early-career faculty members. -4
29. I don't need TPD because my teaching is very low-tech. -4

Additional Items that Assisted the Interpretation of Factor 1

3. I attend TPD because I enjoy learning new knowledge. +3
20. Offering a stipend can help faculty members commit to full participation in a TPD. +3
26. My department values TPD. +2
25. My college values TPD. +1 **
14. I prefer TPD when it allows me to work on my own teaching projects. +1
13. I prefer TPD when it provides on-site technical support. 0 *
30. Faculty need to be as digitally agile as their students. -1
32. Technology improves teaching effectiveness. -1
33. Integrating technology into teaching increases student engagement. -1

Note. Consensus statements were italicized. * P<0.05. ** P<0.01.

Table 4.9

Factor 2: Participants' Background Information

P No.	Gender	Professional Rank	Department	Sorts Weight within the Factor	Follow-up Interview
13	M	Associate Professor	Communication Sciences and Special Education	10	
11	M	Professor	Kinesiology	6.91	N/A
12	F	Professor	Lifelong Education, Administration, and Policy	5.78	

Table 4.10

Factor Interpretation Crib Sheet for Factor 2

Items Ranked at +4
17.I prefer TPD when it involves hands-on activities. +4 **
25.My college values TPD. +4 **
6.TPD provides valuable opportunities for me to learn innovative teaching ideas. +4
Items Ranked Higher in the Factor 2 Array than in Other Factor Arrays
26.My department values TPD. +3
11.I prefer TPD when it connects to practical teaching challenges. +3
16.I prefer TPD when it focuses on my discipline. +3
22.Time is the biggest obstacle for my participation in TPD. +3
15.I prefer TPD when it introduces technological teaching tools. +2
13.I prefer TPD when it provides on-site technical support. +2 **
12.I prefer TPD when it provides case studies or teaching examples. +2
27.TPD is most helpful to early-career faculty members. +1 **
Items Ranked Lower in the Factor 2 Array than in other Factor Arrays
8.I would attend TPD if a colleague recommended it. 0
10.TPD helps me to create a personal professional network. -2 *
24.Teaching is my priority compared to research. -2
7.TPD provides a safe environment for me to ask questions and share struggles. -3
34.Offering food is a good way of attracting faculty members to participate in TPD. -3
30.Faculty need to be as digitally agile as their students. -3 *
Items Ranked at -4
36.I prefer in-depth TPD programs with multiple sessions. -4
19.I would only attend TPD if a stipend is offered. -4
28.Participation in TPD should be considered in regard to promotions. -4 **
Additional Items that Assisted the Interpretation of Factor 2
21. I would attend TPD even without receiving a stipend. +1
32. Technology improves teaching effectiveness. 0
33. Integrating technology into teaching increases student engagement. 0

Note. Consensus statements were italicized. * $P<0.05$. ** $P<0.01$.

Table 4.11

Factor 3: Participants' Background Information

P No.	Gender	Professional Rank	Department	Sorts Weight within the Factor	Follow-up Interview
4	F	Professor	Language and Literacy Education	10	X
1	F	Clinical Associate Professor	Educational Theory and Practice	1.61645	X

Table 4.12

Factor Interpretation Crib Sheet for Factor 3

Items Ranked at +4
14.I prefer TPD when it allows me to work on my own teaching projects. +4 **
35.I prefer TPD workshops that take no more than 1 hour. +4
20.Offering a stipend can help faculty members commit to full participation in TPD. +4
Items Ranked Higher in the Factor 3 Array than in other Factor Arrays
16.I prefer TPD when it focuses on my discipline. +3
8.I would attend TPD if a colleague recommended it. +3
22.Time is the biggest obstacle to my participation in TPD. +3
19.I would only attend TPD if a stipend were offered. +2 **
31.I can teach myself about technology. +2
4.I attend TPD because I want to know what my colleagues are doing. +2 *
9.I would attend TPD if I have a personal connection with the presenters. +1
18.I prefer TPD when it provides individual feedback on my teaching. +1
2.I attend TPD because I have to teach online courses. 0
Items Ranked Lower in the Factor 3 Array than in other Factor Arrays
11.I prefer TPD when it connects to practical teaching challenges. 0
12.I prefer TPD when it provides case studies or teaching examples. 0
17.I prefer TPD when it involves hands-on activities. -1
21.I would attend TPD even without receiving a stipend. -2
32.Technology improves teaching effectiveness. -3 *
33.Integrating technology into teaching increases student engagement. -3 **
25.My college values TPD. -3
Items Ranked at -4
36.I prefer in-depth TPD programs with multiple sessions. -4
13.I prefer TPD when it provides on-site technical support. -4
26.My department values TPD. -4 **
Additional Items that Assisted the Interpretation of Factor 3

6. TPD provides valuable opportunities for me to learn innovative teaching ideas. +2
5. TPD provides valuable opportunities for me to reflect on my pedagogy. +1
10. TPD helps me to create a personal professional network. +1
34. Offering food is a good way of attracting faculty members to participate in TPD. -1
37. I prefer online TPD. -1
29. I don't need TPD because my teaching is very low-tech. -2

Note. Consensus statements were italicized. * P<0.05. ** P<0.01.

Table 4.13

Factor 4: Participants' Background Information

P No.	Gender	Professional Rank	Department	Sorts Weight within the Factor	Follow-up Interview
6	F	Clinical Assistant Professor	Lifelong Education, Administration, and Policy	10	X
14	F	Associate Professor	Educational Theory and Practice	1.68788	X

Table 4.14

Factor Interpretation Crib Sheet for Factor 4

Items Ranked at +4
1.I attend TPD because I want to improve my teaching practice. +4
3.I attend TPD because I enjoy learning new knowledge. +4
37.I prefer online TPD. +4 **

Items Ranked Higher in the Factor 4 Array than in other Factor Arrays
23.Commuting to campus interferes with my participation in TPD. +3 **
10.TPD helps me to create a personal professional network. +3
33.Integrating technology into teaching increases student engagement. +3 *
15.I prefer TPD when it introduces technological teaching tools. +2
28.participation in TPD should be considered in regard to promotions. +1
32.Technology improves teaching effectiveness. +1
30.Faculty need to be as digitally agile as their students. 0

Items Ranked Lower in the Factor 4 Array than in other Factor Arrays
8.I would attend TPD if a colleague recommended it. 0
14.I prefer TPD when it allows me to work on my own teaching projects. -1 *
4.I attend TPD because I want to know what my colleagues are doing. -1
20.Offering a stipend can help faculty members commit to full participation in a TPD. -2

16.I prefer TPD when it focuses on my discipline. -3
9.I would attend TPD if I have a personal connection with the presenters. -3
25.My college values TPD. -3

Items Ranked at -4

31.I can teach myself about technology. -4
27.TPD is most helpful to early-career faculty members. -4
29.I don't need TPD because my teaching is very low-tech. -4

Additional Items that Assisted the Interpretation of Factor 4

18. I prefer TPD when it provides individual feedback on my teaching. -1
26. My department values TPD. -1

Note. Consensus statements were italicized. * P<0.05. ** P<0.01.

Table 4.15

Consensus Statements

Statement	Factor 1		Factor 2		Factor 3		Factor 4	
	Array	**Z-score**	**Array**	**Z-score**	**Array**	**Z-score**	**Array**	**Z-score**
2.I attend TPD because I have to teach online courses.	-3	-1	-2	-0.9	0	-0.1	-2	-0.9
5.TPD provides valuable opportunities for me to reflect on my pedagogy. *	3	1.15	2	0.81	1	0.52	1	0.44
6.TPD provides valuable opportunities for me to learn innovative teaching ideas.	4	1.6	4	1.46	2	0.78	2	0.76
11.I prefer TPD when it connects to practical teaching challenges.	2	0.93	3	1.06	0	0.06	2	0.57
12.I prefer TPD when it provides case studies or teaching examples.	1	0.35	2	0.81	0	-0.1	1	0.51

Note. All listed statements are non-significant at P > 0.01, and those marked with an * are also non-significant at P > 0.05.

Table 4.16

Interview Participants in the Factor 1 Group

P No.	Gender	Professional Rank	Sorts Weight within the Factor	Factor Loading
7	M	Professor	9.25	0.75
8	F	Clinical Associate Professor	8.15	0.72
16	F	Lecturer	7.88	0.72
17	F	Professor	3.6	0.50

Table 4.17

Participants in the Outlier Group

Participant No.	Professional Ranking	Gender	Self-selected Perspective Profile(s)
18	Clinical Professor	Female	F2
20	Assistant Professor	Female	F1 & F2, but wish to be in F3
21	Associate Professor	Female	F2
22	Associate Professor	Male	F3
23	Professor	Male	F2

CHAPTER 5

DISCUSSION AND CONCLUSION

This Q study investigated the perceptions of faculty members at a college of education (COE) toward their participation in technology-based teaching professional development (TPD). This chapter includes a summary of major findings that relate to the literature on faculty motivation, professional development in higher education, and faculty beliefs toward the integration of technology in teaching practices. Also included is a discussion of connections to findings of this study and self-determination theory alongside what implications may be valuable for use by professional development leaders, higher education administrators, and faculty members who work at research universities. The chapter concludes with a reflection on the limitations of the study and suggestions for future studies. The research questions that guided this study are:

1. What are the perceptions of faculty members at research universities toward voluntary technology-based TPD programs?
2. What motivated faculty members at research universities to participate in voluntary technology-based TPD programs?
3. What prevented faculty members at research universities from participating in voluntary technology-based TPD programs?

Summary of Results

It is critical to identify the motives for and barriers against the voluntary participation of faculty members at research universities in teaching professional

development (TPD). System-wise, maintaining a high participation rate for TPD among faculty members is a fundamental mission for institutions to fulfill the public's demands for teaching excellence in higher education. Encouraging faculty members' participation in well-designed TPD programs is a practical approach for institutions to promote the advantages of technology for teaching, particularly when colleges and universities have heavily invested in those technologies. However, research universities tend to have a relatively low participation rate for TPD compared to other types of higher education institutions (Lowenthal et al., 2012). This study investigated the perceptions of faculty members at research universities toward technology-based TPD and the motives and barriers for faculty members' participation in TPD. This study aims to comprehensively provide suggestions and implications for stakeholders to encourage more faculty members at research universities to participate in TPD.

Self-determination theory (SDT) was used as the theoretical framework for the study. SDT investigates how social contexts interfere with basic psychological needs, *autonomy, competence,* and *relatedness*. SDT focuses on the sources of motivation instead of the amount of motivation. The foundation of SDT is an autonomy continuum of human motivation from *amotivation, extrinsic motivation,* to *intrinsic motivation*. Ryan and Deci (2017) explained that how people interpret the causes of the action or the activity, called *perceived locus of causality* (PLOC), determine their subsequent behaviors. Thus, autonomous components could exist only when extrinsic motivation exists. According to SDT, four types of extrinsic motivation—*external regulation, introjection regulation, identified regulation,* and *integration regulation*—are identified based on different PLOC. A review of SDT studies indicated that SDT is a robust and

effective framework for investigating of the motivation of faculty members in various contexts.

A Q methodological research design was used to capture subjective views held by faculty members in a large college of education (COE) at a research-intensive university about their participation in TPD. The core technique of Q methodology is a sorting activity known as a Q-sort. A Q-sort comprising 37 statements that described faculty members' motivation for and barriers against participation in TPD, was created for the study. The Q-sort was completed by 17 COE faculty members and analyzed with a web-based Q software, KenQ (Banasick, 2018). The result of the Q factor analysis was a four-factor solution. The interpretation of the Q factor analysis was supplemented by multiple data sources, including demographic survey data, post-sorting questionnaires, and follow-up interviews. The follow-up interviews involved a representative number of participants from the factor one, factor three, factor four groups, and five participants from the outlier group. Four distinct viewpoints were identified from the Q factor analysis: *F1) Passionate Learners; F2) Problem-Oriented Learners; F3) Social Learners;* and *F4) Tech Lovers.* Two additional themes, *A wrestle between personal interests and systematic values* and *I can teach online but not learn online*, emerged from follow-up interviews.

Passionate Learners indicated that their motivation for participation in TPD was mostly intrinsic and strongly tied to their beliefs in being lifelong learners. They presented a passion for learning innovative ideas in general. Also, *Problem-Oriented Learners* would only be motivated to attend TPD when they encountered a contextualized challenge in practice. They expect scholarly evidence for the effectiveness of any possible solutions that are introduced in TPD. *Social Learners* considered time to be their

primary barrier against participation in TPD. Thus, they preferred that individualized learning follow a personal learning agenda. But they would be highly motivated to participate if their trusted peers recommended TPD activities. *Tech Lovers* showed a strong interest in technology integration in teaching, including online teaching. They acknowledged the advantages of online education and expected others to recognize their expertise in online teaching. Two additional themes that emerged from the follow-up interviews were presented as two individual cases. The case of *A wrestle between personal interests and systematic values* showed an early career faculty member's constant struggle of sacrificing her passion for teaching for mandatory investment in research by the university within an intensive tenure timeline. This case presents a typical experience of an early-career faculty member who wrestles between individual beliefs and perceived system values. The other case, *I can teach online but not learn online,* described an experience of being forced to teach online during the pandemic but reluctant to appreciate the online-learning mode. The faculty member, in this case, illustrated his experience of hosting a two-day online TPD for K12 teachers. He perceived his online TPD was successful, but he refused to attend any online TPD for his own personal professional development. He stressed that one significance factor for his participation in TPD is a face-to-face environment. Each viewpoint and theme had notable distinguishing characteristics and contributed to an in-depth understanding of motivation for and barriers against faculty members' participation in TPD.

Discussion of Results

Research Question 1: What are the perceptions of faculty members at research universities toward voluntary TPD programs that focus on teaching with technology?

The results of the Q-sorts and follow-up interviews revealed four distinct perspectives on the participation of faculty members in technology-based TPD—profiles of *Passionate Learners*, *Problem-Oriented Learners*, *Social Learners*, and *Tech Lovers*. The consensus statements among the Q-sorts indicated that the four profiles shared some commonality regarding participation in technology-based TPD. First, faculty members widely supported TPD that focuses on innovative concepts, strategies, and instruments that could easily be adapted in a practical teaching context. The practicability of TPD content was most relevant to *Problem-Oriented Learners*, but faculty members from all four profiles indicated a similar motivation pattern regarding the TPD content. Few faculty members might be interested in exploring new ways of integrating innovations into their teaching, but the majority of faculty members are only willing to learn about well-investigated or evidence-based strategies and innovations for teaching excellence. If faculty members learned about strong connections between innovative ideas and practical challenges in TPD sessions, they would be more motivated to participate in the future.

Although most faculty members acknowledged that TPD could offer opportunities for learning best teaching practices, those opportunities were valued in different degrees from various standpoints. To be more specific, faculty members agreed that TPD could help them to reflect on their current pedagogies, but some of the faculty members have doubts about the necessity and the effectiveness of participating in TPD to

improve teaching. *Passionate Learners* highly valued the worth of TPD compared to the other three profiles. According to *Passionate Learners*, research and teaching should not be considered as separate pieces. The nexus of research and teaching was highlighted in *Passionate Learners'* experience. Thus, learning for innovative and best practices of teaching was judged by *Passionate Learners* as a long-lasting and must-have task in their career development. According to the Passionate Learners group, the fact that someone has already attained a level of teaching competence or even teaching excellence is not a valid reason to forego TPD opportunities.

In contrast, *Problem-Oriented Learners* were more interested in research-related activities if they had to participate in professional development. Participation in TPD was only perceived as beneficial when *Problem-Oriented Learners* encountered a context-specific teaching challenge, and a TPD event addressed their need-based solutions. Therefore, *Problem-Oriented Learners* viewed TPD as most helpful to early-career faculty members who were more likely to have teaching challenges. *Problem-Oriented Learners* were less interested in following innovative trends in the teaching domain. Instead, *Problem-Oriented Learners* would carefully examine scholarly evidence for the effectiveness of any innovative ideas or tools before accepting them.

Social Learners were very interested in coping with the creative and innovative ideas of their colleagues, although they might not have planned to implement those ideas in their teaching. *Social Learners* regarded teaching as relationship building, and they highly valued the connections with peers. Thus, TPD was perceived as an inspirational place for *Social Learners* to explore creative proposals that related to their interests but with little time commitment. Although *Social Learners* were more open to exploration,

they were like *Problem-Oriented Learners* regarding a strong preference that TPD should provide a domain-specific context. When participating in TPD, *Social Learners* expected to receive peer feedback on individual teaching projects.

Tech Lovers were also very open for exploration, but their passion was focused on teaching with technology. Similar to *Passionate Learners*, *Tech Lovers* also recognized students' generational demands. However, *Tech Lovers* perceived technology as a more significant component for their teaching. Faculty members belonging to the other three profiles viewed technology as a supplementary tool for teaching. *Tech Lovers* anticipated learning about technological tools during their participation in TPD. They also appreciated online learning the most among all the participants. Online TPD appeared to have more attractive and advantageous to *Tech Lovers*. According to *Tech Lovers*, TPD should embody and align with the departmental or even broader scale strategical plans instead of faculty members' individual pursuits. *Tech Lovers* then believed that online TPD could support the continuity and sustainability of professional development among all branch campuses.

Regarding COE, faculty members also expressed different opinions on the perceived value of TPD at the university. *Passionate Learners* considered that TPD was well-valued within the university. *Passionate Learners* not only engaged in TPD themselves but also believed that other COE faculty members valued TPD, especially when compared to their colleagues in other colleges. *Problem-Oriented Learners* agreed with *Passionate Learners* that TPD was well valued within the university, although they had not recently participated in TPD. *Problem-Oriented Learners* asserted that many TPD sessions were offered at the university level, which was convincing evidence to

conclude that the university community values TPD. However, *Social Learners* and *Tech Lovers* provided counter-arguments. *Tech Lovers* pointed out that the departmental activities influenced faculty members more than those at the university or college levels. For example, encouragement from the department chair or listing TPD on the departmental agenda would be more likely to increase the perceived value of TPD among faculty members. *Social Learners* observed that many of their colleagues engaged in TPD but considered that the action represented personal pursuits instead of value held university-wide.

Research Question 2: What motivated faculty members at research universities to participate in voluntary TPD programs that focus on teaching with technology?

The Optimal Motivation – Enjoyment that Roots in Learning

Four distinct faculty profiles revealed various types of motivation for faculty members' participation in TPD. According to Self-determination Theory (SDT), human motivation consists of three psychological needs: *autonomy*, *competence*, and *relatedness* (Ryan & Deci, 2017). SDT also asserted an autonomy continuum across *intrinsic motivation, extrinsic motivation,* and *amotivation* to describe motivation that was derived from different types of PLOC (Ryan & Deci, 2017). Intrinsic motivation was characterized as highly autonomous, self-determined, and spontaneous in which individuals would focus on the present experience and feel rewarded as they engage in the activity itself (Deci & Ryan, 2000; Ryan & Deci, 2017). *Passionate Learners* presented most of the attributes of intrinsic motivation. Their firm belief in life-long learning was *Passionate Learners'* most distinguishing characteristic. According to *Passionate Learners*, their excitement for learning was not limited to teaching-related

topics but covered every aspect of their work and lives. The enjoyment and satisfaction for *Passionate Learners* were inherited while exploring the unknown, so the future and outcomes were less relevant to their goals. Learning was the primary motivation for *Passionate Learners'* participation in TPD. Thus, *Passionate Learners* were open to new teaching ideas without requiring a specific achievement. Intrinsic motivation for learning was the optimal motivation in the context of their participation in TPD.

Integrated Regulation – Internalization of the Value of Technology

Evidently, *Tech Lovers* highly acknowledged the value of integrating technology in teaching. Passion for technology was *Tech Lovers'* primary motivation for participation in TPD. But *Tech Lovers* specified that they did not enjoy the process of learning digital tools, and, in fact, they suffered from a learning curve using technology. To be more specific, *Tech Lovers* did not experience the inherent enjoyment of the activity during their participation in TPD. Ryan and Deci (2017) classified motivation that compelled "individuals to engage in behaviors and practices that are not necessarily interesting" (p. 220) as *extrinsic motivation* because of the external PLOC of the behavior.

However, *Tech Lovers* also showed a relatively high level of autonomy regarding their pursuits of teaching with technology since no external forces required faculty members to use technology in their teaching before the COVID disruption. *Tech Lovers* might learn about the advantages of technology through systematic promotion, past experiences, conversations with students, or scholarly publications. In short, *Tech Lovers* appreciated the value of technology from external contexts that were significant to them, but they fully internalized those external values and believed in the benefits of

technology. Thus, even though *Tech Lovers* did not enjoy the learning of technology itself, they were highly autonomous regarding their participation in TPD.

According to SDT, external motivation could be highly autonomous when individuals fully transformed external values that guided their behaviors into their own, which is defined as *Integrated Regulation* (Ryan et al., 1985; Ryan & Deci, 2000a, 2017). Although integrated regulation has an external PLOC, it is the most intrinsic type of motivation on the autonomy continuum for extrinsic motivation. Ryan and Deci (2017) explained that integrated regulation is extremely similar to intrinsic motivation because both types of motivation maintain a high level of autonomy. Individuals with intrinsic motivation focus on the present experience, whereas future outcomes of the activity play a significant role in integrated regulation (Ryan & Deci, 2000a). *Tech Lovers* did not gain enjoyment from learning itself, but they expected that long-term outcomes from their learning would benefit their careers. Thus, autonomy and competence were highly relevant to the motivation of *Tech Lovers*.

Identified Regulation – Perceived Function of TPD

According to Ryan and Deci (2017), it is common that multiple types of motives concurrently determine a given behavior or action. Other than autonomous motivation, the perceived value of TPD also played an important role in motivation for participation in TPD for all faculty participants. Faculty members' perceived value of TPD is related to *Identified Regulation*, which refers to "a conscious endorsement of values and regulations" (Ryan & Deci, 2017, p. 230). As described in previous sections, faculty members showed various perspectives regarding the value and effectiveness of TPD at research universities.

Passionate Learners and *Tech Lovers* believed that their students expect innovative teaching methods, so they were motivated to search for new knowledge and expertise in teaching to satisfy their students' demands. Meanwhile, many faculty participants endorsed the effectiveness of TPD in providing them such knowledge and expertise. Ryan and Deci (2017) claimed that individuals would view the activity as personally important when they recognized the importance of the behavior. For example, in the interviews, while some faculty members identified the value of participating in TPD or a teaching community and believed it was vital to their identity as COE faculty members, others resonated oppositely. Thus, when faculty members realized that participation in TPD is part of their identification as COE faculty members, they would be more willing to invest time and effort in TPD.

Also, *Problem-Oriented Learners*, for example, did not echo the connection of participation in TPD and their identities as COE faculty members. According to *Problem-Oriented Learners*, if they did not experience any teaching challenges, they felt as though they had no need to participate in TPD. Unlike *Passionate Learners* and *Tech Lovers*, *Problem-Oriented Learners* only acknowledged the value of TPD as a solution provider. Although somewhat autonomous, the motivation of *Problem-Oriented Learners* was less volitional. Worth noting, due to their relatively low perceived value of TPD, *Problem-Oriented Learners* also showed no interest in or motivation for immediate action even if external rewards were available.

To conclude, when *Problem-Oriented Learners* did not have a challenging teaching situation, they perceived TPD as an almost impersonal activity. But when they encountered a challenge and looked for a solution, their motivation for participation in

TPD is related to *identified regulation*. TPD might be a relatively low priority for *Problem-Oriented Learners,* consequently their motivation to participate is derived from personal interests.

Relationships Motivation—The Importance of Relatedness

The motivation of *Social Learners* was quite intriguing to interpret. According to the Q-sorts and interview results, *Social Learners* presented somewhat autonomous motivation for their participation in TPD since they highly prioritized their personal needs and interests. Meanwhile, *Social Learners* also presented somewhat identified regulation by acknowledging the role of TPD in helping them to learn and grow. However, what seemed imperative to *Social Learners* was the connections with others regarding their participation in TPD. According to SDT, *relatedness* is one of three basic psychological needs rooted in the social contexts to support or diminish motivation (Deci & Ryan, 2008; Ryan & Deci, 2017). The need for relatedness was often represented as a demand for belonging in a community or a social environment (Ryan & Deci, 2000a). *Social Learners* showed a very focused interest in their domain or areas of expertise compared to *Passionate Learners* who were open to interdisciplinary explorations. But *Social Learners* were also different from *Problem-Oriented Learners,* who also focused on domain-specific contexts. Unlike *Problem-Oriented Learners, Social Learners* might not have a specific and contextualized challenge that needed to be solved but are purely interested in what others are doing in their small community of interests. One participant in the *Social Lovers* group used the metaphor of a religious retreat to describe the ideal TPD environment. An important aspect of religious retreats is their emphasis on relationship and community building. In contrast, *Problem-Oriented Learners* cared little

about relationships or community building. It was very likely that *Social Learners* enhanced their sense of belonging while learning innovative ideas in a small community, which might not be teaching-specific but certainly contributed to a community of interest.

Ryan and Deci (2017) explained that human beings have consistently gained significant benefits from close relationships, so individuals are often intrinsically motivated to build and "maintain close, open, and trusting relationships with others" (p. 354). In fact, the phrase *trusting peers* was frequently mentioned during interviews with *Social Learners*. The definition of trusting peers was unclear in the interviews. However, *Social Learners* indicated that friends and colleagues who shared the same interests with them had a significant influence in terms of their participation in TPD. Based on *Social Learners'* descriptions of their TPD experiences, their motivation was most autonomous and volitional when peers recommended or participated in the same activity. *Social Learners* did not provide a clear explanation as to why trusting peers have such a strong influence on their decision-making. But the assumption is that *Social Learners* could gain a stronger sense of belonging and strengthen their social connections by having a shared experience with peers.

However, according to SDT, relatedness in the social environment could also diminish motivation when perceived as negative (Ryan & Deci, 2017). Other than peer relationships, the relationship with the TPD presenter or leader is another critical element for relatedness in the context of TPD. One participant from the *Tech Lovers* group described a negative experience with one TPD presenter, which completely eliminated her future engagement in the activities delivered by that presenter. Although the need for relatedness was not a primary motivation for *Tech Lovers*, a negative relationship could

be a deal-breaker for faculty members' participation in TPD. The faculty participant did not elaborate on the origin of her negative relationship with the TPD presenter. So, it is unclear why she distrusted that TPD presenter.

According to Ryan and Deci (2017), relatedness satisfaction has intriguing connections with autonomy. There is "a functional significance" (Ryan & Deci, 2017, p. 354) when individuals perceived that others' interactions with them were not autonomous and volitional in an adult-adult relationship. Ryan and Deci (2017) stressed that a sense of selflessness is crucial to conveying a true relational bond. Thus, satisfaction concerning relatedness would be significantly diminished if faculty members perceived that TPD presenters or leaders were seeking external or personal gains, which could induce little interest in participation in TPD.

External Rewards and Autonomy

Although *Passionate Learners* were primarily motivated by their passion for learning regarding their participation in TPD, some of them admitted that money made a difference when they were undecided about participating in TPD. External rewards were concluded as *External Regulation* on the autonomy continuum (Ryan & Deci, 2000a). According to Ryan and Deci (2000b), external incentives, such as money, can motivate individuals to enact immediate behavior. Thus, a stipend could quickly persuade faculty members to prioritize a TPD event over other tasks.

However, giving rewards for completing an activity implies a low perceived value of the action (Ryan & Deci, 2017). One participant from the *Passionate Learners* group confirmed Ryan and Deci's (2017) argument by explaining her past experiences with TPD. Deci and Ryan (1980, 1985a) also showed that external rewards might diminish

individuals' autonomy when perceived as controlling their behavior. Rewards that were presented as salient and potent could have a negative impact on sustaining intrinsic motivation over time (Ryan & Deci, 2017). One participant from the *Tech Lovers* group reiterated that a stipend was a must-have for her participation in TPD even when the topic interested her. She disclosed that money is currently more important than her participation. This participant was also involved in my 2016 study, and she had claimed a firm commitment and passion for teaching with technology back then. Although she had indicated it was difficult to justify committing the necessary time for TPD, she explained that her interests in the TPD topics were the most important motivator for her participation. She still maintains the same passion for technology, but external incentives dominated her motivation to participate in TPD.

When individuals perceive the condition of rewards as not controlling, it is possible for rewards to convey the value of activity and not undermine intrinsic motivation (Ryan & Deci, 2017). In a comparison study, Marinak and Gambrell (2008) found that using books as a reward signified the value of reading instead of undermining intrinsic reading motivation when contrasted with the use of tokens as a reward. Faculty members from *Passionate Learners* also mentioned that rewards for participation in TPD could be non-monetary, and that they would be equally motivated to participate. Ryan and Deci (2017) also pointed out that the condition of rewards could influence intrinsic motivation. For example: 1) a reward is given for showing up during the TPD session; 2) a reward is given for completing an innovative teaching project during the TPD participation; and 3) a reward is given for criterion-based performance. These three conditions of rewards would impact on autonomy differently, although all rewards were

provided as “a positive external incentive for acting” (Ryan & Deci, 2017, p. 157). Therefore, careful planning about the format of rewards, if available, should be examined before the TPD event.

Research Question 3: What prevented faculty members at research universities from participating in voluntary TPD programs that focus on teaching with technology?

Faculty members from all four profiles identified several barriers to their participation in TPD, such as time and commuting distance. These types of barriers are well documented in the literature (Bouwma-Gearhart, 2012; Burdick et al., 2015; Lowenthal et al., 2012). Although faculty members described barriers to their participation in TPD as external and objective, implicit psychological interferences might play an essential role when viewed from a phenomenological perspective of SDT. SDT extended the concept of PLOC based on Heider’s (1958) work, which refers to individuals’ perceptions of themselves and others in the context of daily events (Ryan & Deci, 2017). When individuals consider themselves as “an origin of action” (Ryan & Deci, 2017, p. 84), their judgment was defined as an *internal perceived locus of causality* (I-PLOC). In contrast, when individuals felt that their actions were induced by external pressure or incentives, the activity was categorized as the *external perceived locus of causality* (E-PLOC). Individuals’ interpretations of the causes of actions matter significantly to their subsequent behaviors (Heider, 1958). Thus, SDT could provide some new insights if we look at external barriers, such as time demands and the overall frustration involved with commuting between home, office, and TPD locations, regarding faculty members’ participation in TPD from a phenomenological perspective of SDT.

Internal Perceived Locus of Causality—Perceived Value of TPD

As described earlier, when individuals could not resonate or identify the value of an activity, their PLOC of the activity would be impersonal, which consequently leads to a low motivation to act. Consider *Problem-Oriented Learners* as an example; they only partly identified the value of TPD and only considered TPD as relevant in their professional lives when a problem occurs. Thus, the PLOC of *Problem-Oriented Learners'* motivation was external and situational – depending on the timing and the context of their problems. *Passionate Learners* also believed that COE faculty members should maintain their expertise as teachers by constantly learning. The PLOC of *Passionate Learners'* motivation was internal and personal because they fully identified the value of TPD as a learning resource and associated participation in TPD as part of their identities as COE faculty members.

Also, SDT identified three basic psychological needs in social contexts: autonomy, competence, and relatedness. According to the theory, these needs are required for an individual to thrive and be healthy (Ryan & Deci, 2017). When the social context could not satisfy or support these three needs, individuals' motivation for the desired action would be diminished or even eliminated. For instance, one faculty participant explained that most TPD contents were *too basic* for COE faculty members who were familiar with many theoretical and pedagogical concepts. Similarly, *Problem-Oriented Learners* commented that TPD often provided limited new information for them. Therefore, some COE faculty members perceived that TPD failed to satisfy their needs for competence, which led to low motivation for participation.

Finally, according to their narratives, TPD could not satisfy the need for relatedness for some faculty members according to their narratives. For example, one faculty participant indicated no interest in joining a teaching community but would prefer to satisfy their needs for relatedness in communities for researchers. Some faculty members showed strong resistance to online TPD and doubted that trusting relationships could be created and maintained in an online environment. Some faculty members claimed that it is unlikely to create a sense of community through short-term TPD, such as hour-long workshops. Although faculty members provided various reasons for their dissatisfaction with TPD, we could conclude that they did not perceive TPD as an effective space to satisfy their needs for relatedness. Therefore, one result of this study is that the low perceived value of TPD goes beyond external barriers, such as time commitment. When faculty members perceived TPD as failing to meet their needs for competence and relatedness, they prioritized other activities over participation in TPD due to the absence of internal PLOC.

External Perceived Locus of Causality – Research vs. Teaching

Undoubtedly, faculty members who work at research-intensive universities have an intensive schedule and heavy workload. It is easy to understand why faculty members identify time as their primary obstacle for participation in TPD. However, the number of hours that faculty members spend on TPD every academic year worth questioning. Studies on K12 teachers in the southwest region of the U.S. have shown that an average of 49 hours of professional development in a year was needed to increase students' achievement by about 21%, while 14 hours or fewer showed no effect on students' learning (Yoon et al., 2007). K12 teachers also reported an average of 44 hours of

content-specific professional development (including mandatory PDs) in one year in a recent national study (García & Weiss, 2019). However, research on higher education faculty members has provided limited information regarding the average number of hours of faculty members' participation in TPD in a year. It is doubtful that TPD consumes a significant amount of faculty members' time because studies have shown that most faculty members at research universities devote much of their time to conducting research and seeking grants (Anderson & Slade, 2016; Santos, 2016). Many faculty members believed that departmental and university administrators pressured them to invest more time in research and grants to order to increase their research productivity (Anderson & Slade, 2016). The case of the assistant professor from the outlier group in this study was consistent with findings from existing literature about external pressures from powerful authority figures on faculty members' research progress. Thus, faculty members might have a strong external PLOC to prioritize research over teaching-related activities, such as TPD, when they work at a research-intensive university.

It is also common for faculty members to view research and teaching as separate activities that compete for their time (Alpay & Jones, 2011; Miller et al., 2011). Even in a COE, where teaching is more likely be a focus of research than in other colleges, many faculty members described their research interests as isolated from their teaching practices. *Passionate Learners* were the only group, which was also the most autonomous group, that stressed the importance of the nexus of research and teaching in their professional growth. *Passionate Learners* indicated that they equally valued teaching and research activities and often were able to combine their teaching practices with research interests. The Q-sorts and narratives of *Passionate Learners* showed that they had the

least resistance to investing time and effort in TPD. In other words, *Passionate Learners* were able to combine and transform the motivation for research activities into the internal PLOC for learning innovative teaching ideas, which led to autonomous and volitional motivation for participation in TPD.

Unlike K12 teachers, faculty members in higher education participate in TPD on a generally voluntary basis. Therefore, participation in TPD is optional for faculty members and is not part of the activities organized for sustainable growth by the institution. It is then reasonable that faculty members such as the *Problem-Oriented Learners* consider participation in TPD as beneficial only when they need to improve a specific teaching situation. The importance of helping faculty members solve specific teaching challenges is undeniable. But when the goal of TPD is not aligned with an institution's strategic plan, faculty would like to perceive TPD to be of little or no value.

Implications

Implication for Q Studies

The design of this study offers insights to Q scholars on ways to improve Q methodology based on qualitative research practices. For example, in this study I interviewed the participants who completed the Q-sorts after I completed the Q-factor analysis and preliminary interpretation of the resulting factors. This enabled the participants to critique my preliminary interpretation. This procedure offers the potential to significantly improve the *trustworthiness* of the factor interpretation and empower participants in the research process for Q studies. Q, as a unique mixed-methods methodology, has its standards for internal validity and reliability for empirical studies (Brown, 1993; McKeown & Thomas, 2013). Methods to improve the validity of Q's

quantitative design, such as factor rotation, are well-documented in the Q literature (Brown, 2017; McKeown & Thomas, 2013; Watts & Stenner, 2012). In contrast, the validity of Q factor interpretation is rather neglected in the methodological discussion for Q studies. The process of Q interpretation is often presented as a somewhat mysterious process in most Q studies. Q researchers rarely make clear the process they followed to arrive at their interpretation. Although some scholars, such as Sneegas (2020), have introduced the importance of discourse analysis in Q studies (Sneegas, 2020), this practice is not established within the Q community.

The interpretation of Q factors often involves an analysis of Q-sorts, factor arrays, and participants' comments immediately upon completion of the Q-sort. However, Q researchers rarely provide a detailed account of how they use these data sources in their interpretation process. To correct this, Watts and Stenner (2012) introduced the crib-sheet method for Q researchers to maintain consistency in the interpretation process. The crib-sheet method aims to keep the "methodological holism", so Q researchers can explain the "entire item configuration captured in the relevant factor array" (Watts & Stenner, 2012, p. 149) rather than merely focus on statistically significant items. However, many veteran Q researchers, such as Steven Brown and Sue Ramlo, explained informally in conversations on the Q listserv that their interpretation often rely heavily on a "holistic feeling" of the data. Stephenson (1983) also described his interpretation of Q data as "a grasp of feeling" (p. 103) when clarifying the factor interpretation procedure. But using the word "feeling" to justify a research process seems ambiguous and lacks rigor.

Qualitative researchers have likewise been prone to criticisms concerning subjective tendencies within the process of qualitative analysis. However, the concern for

the validity of researchers' representation of qualitative data has long been discussed in the qualitative community. For example, Borland (1991) shared an interpretive conflict where the participant (her grandmother) showed strong disagreement with her interpretation of narratives from a feminist lens. The participant claimed that "the female struggles as [described in the interpretation] never bothered me in my life" (Borland, 1991, p. 69). Borland (1991) then carefully examined the potential reasons that might cause the discrepancy between the researcher and the participant to fully picture the narrative. Borland (1991) then asked a crucial question for qualitative inquiries, namely "who controls the text?" (p. 70).

A strength of Q is its focus on the self-referent significance in relation to the participant's experience from a first-person perspective (McKeown & Thomas, 2013; Watts & Stenner, 2012). If this is the case, participants should be empowered in the research process to avoid a researcher-dominant representation of meaning in Q studies. However, current Q literature presents a limited discussion on participants' involvement in the interpretation process. In fact, qualitative researchers have provided many techniques and strategies that Q researchers would likely find very useful and helpful to empower participants in the inquiry process.

Furthermore, the qualitative community has developed clear criteria for the rigor of the qualitative inquiry, which is referred to as *trustworthiness* (Lincoln & Guba, 1985). The trustworthiness of qualitative inquiries could be outlined as credibility, dependability, confirmability, transferability, and authenticity (Connelly, 2016; Cope, 2014; Guba & Lincoln, 1994). Qualitative researchers have also proposed various techniques and strategies, such as triangulation, member checking, and researcher

interview to maintain the trustworthiness of qualitative inquires (Creswell, 2014; Creswell & Miller, 2000; Guba & Lincoln, 1994; Lincoln & Guba, 1985). Most important is member checking, which has been described as "the most crucial technique for establishing credibility [of qualitative inquires]" (Lincoln & Guba, 1985, p. 314). Q researchers would likely find that member checking offers significant benefits in improving the accuracy of their interpretations. Member checking often entails enabling participants to check or approve researchers' interpretations of the data (Carlson, 2010).

When I invited participants to react to my initial interpretation of Q-sorts, many of them not only provided clarification of meaning but also revealed their views on an extensive range of issues, such as teaching, learning, and work. Creswell and Miller (2000) claimed that data should be frequently revisited by the researcher, the participants, and even external readers for accurate and coherent representation of participants' viewpoints. Member checking in Q studies would help researchers rebuild the complexity of subjectivity and reveal the participants' viewpoints. Participants' review of the researcher's interpretation of the Q-sort data could also identify possible biases of the researcher. If Q researchers are sincere in their pursuit of accurate representations of participants' subjectivity, then they should seriously consider enabling participants in their studies to engage in negotiating the meaning-making process (Doyle, 2007).

Implication for TPD Research

An unexpected, but not surprising finding of the study was that some of the faculty participants changed their beliefs and perceptions towards online learning after the disruption caused by the pandemic. During the pandemic, faculty members and students were forced to continue educational activities through online platforms. The

university provided a large number of online workshops, online support groups, and remote technical support to facilitate faculty members' transformation to online education. Faculty members were exposed to a fully online environment for all work activities and were forced to use many digital tools, such as Zoom, to continue productivity.

However, faculty participants completed Q-sorts from March to April 2020 when the pandemic was at an early stage in the United States. Meanwhile, the university had started a fully online operation for instruction, but faculty members had only experienced it for a short time. By the time I interviewed faculty participants to discuss the initial interpretation of the Q-sort data, the university had already operated online only for over six months. Thus, the Q-sort results indicated a neutral to negative perspective toward online learning. But some faculty members explained their online experiences during the pandemic and presented an optimistic attitude toward online education in the interviews.

Ramlo (2021) conducted a Q study to investigate faculty members' perceptions of the transaction from F2F to online during the pandemic. Ramlo (2021) reported three distinct viewpoints that were identified among 78 faculty members from a variety of disciplines in different types of institutions. The three viewpoints were summarized as: 1) Techies who like to teach; 2) Overwhelmed as human beings; and 3) It's about what cannot be done online (Ramlo, 2021). Some of my findings were congruent with Ramlo's (2021) study. For example, Ramlo (2021) reported that faculty members associated with the profile *Techies who like to teach* showed a commitment to technology but did not see technology as a panacea for teaching excellence. *Passionate Learners* and *Tech Lovers* in my study also expressed similar opinions.

Ramlo (2021) also revealed that faculty members associated with profile *Overwhelmed as human beings* indicated that the reasons of their overwhelming were not created by the sudden shift to online instruction or incompetence of technological skills. Eight out of nine participants that were associated with this factor were females who were overwhelmed by life issues, such as being primary caregivers to the family, which were caused by the pandemic (Ramlo, 2021). Participants in my study, such as Participant 4 and Participant 20, also pointed out that faculty members have roles and feelings more than just university-related duties.

The third profile in Ramlo's (2021) study indicated that faculty members from disciplines that require hands-on learning with lab equipment, such as physics, showed strong resistance to online instruction. Faculty members also expressed concerns for negative teaching and learning experiences caused by unstable Internet connection and old laptops provided by the institution (Ramlo, 2021). A case study in a Filipino college during the pandemic also showed that a major concern of faculty members was the unstable Internet connection for both faculty and students and thus were undecided about using online education as a viable alternative for learning (Moralista and F. Oducado, 2020).

Another case study investigated challenges experienced by faculty members in a Russian university during the pandemic (Almazova et al., 2020). The authors reported that the time and effort faculty members need to invest in online instruction, including learning different digital tools, was a major challenge during the pandemic (Almazova et al., 2020). Ramlo's (2021) study indicated a similar theme that lack of technological competence was not a major challenge or concern of faculty members during the shift to

online education. Instead, time, access to technology, and other life roles were identified as the major challenges by faculty members. Due to these challenges, many faculty members were neutral or undecided about using online education as the primary learning mode.

Implication for Theories

O'Sullivan and Irby's (2011) expanded TPD model significantly informed the interpretation of data for this study. The influences of faculty members' workplace community, such as the research-driven culture and relationships with TPD leaders, on faculty members' participation in TPD were well-demonstrated in the study findings. However, the disruption of COVID also revealed that there is a larger community that is more extended than faculty members' workplace community that could have significant influences on their participation and experiences in TPD. I refer to this as the life community. Studies that investigated faculty members', especially females', work-life balance have been well-documented in the literature (Fothergill & Feltey, 2003; Stupnisky et al., 2017; Ward & Wolf-Wendel, 2004). Ramlo (2021) showed that the life situations of faculty members have particularly significant influences on their well-beings and work productivity.

In O'Sullivan and Irby's (2011) expanded TPD model, the most inner circle is the faculty development community, which is surrounded or included by a slightly larger circle—the workplace community. Considering that faculty members "are human first and have lives and feelings not just duties related to teaching" (Ramlo, 2021, p. 252), it is reasonable to propose a third circle for O'Sullivan and Irby's (2011) expanded TPD model—the life community. Faculty members' motivation for and engagement in TPD

activities could be significantly influenced by their life situations or crisis. Thus, it is important to consider including some factors in the life community, such as family relationships, physical and mental health, personal cultural background, and even religious beliefs, when investigating faculty members' experiences with TPD.

SDT is the second theory that has significantly benefited the interpretation of the data for this study. Deci and Ryan (2017) developed mini-theories to explain the effects of external events on intrinsic motivation, effects of PLOC on intrinsic motivation, internalization, individual differences, the three psychological needs, goal-oriented motivation, and the effect of close relationship on intrinsic motivation. The findings of this study were primarily interpreted and re-constructed through the lens of SDT. For example, faculty members' motivation for TPD participation were described regarding their intrinsic motivation, internalization, career goals, effects of external rewards, and interpersonal relationships during TPD participation.

However, although Deci and Ryan (2017) clarified that human behaviors are often decided by not a sole motivation but multiple types of motivation, it is unclear how different combination of motivation worked on human behaviors. Faculty members in my study presented a congruent pattern regarding their motivation for participating in TPD. Even the most intrinsically motivated group – the *Passionate Learners* admitted that they often need some external rewards, such as a stipend, to encourage them to choose TPD among other competing tasks. Motivation theories, SDT included, often stress the importance of intrinsic motivation (Deci & Ryan, 2017). But the combined effects of multiple types of motivation were hardly explained in existing literature. It is possible

that even faculty members are intrinsically motivated to participated in TPD but they still need external factors to push or force them to commit to the TPD participation.

Implication for TPD Practices

The findings of this study offered suggestions and implications for TPD practices in research universities. As discussed earlier, all faculty members in the study indicated somewhat autonomous motivation regarding their participation in TPD, even though their perceived locus of causality (PLOC) of their participation varied. The speculations based on this study's findings might conflict with some strategies that are currently strongly promoted in higher education.

One interesting pattern among all the faculty profiles is a lack of interest in community building regarding TPD. Building a learning community is a common strategy for teacher development in K12 education (Avalos, 2011; Owen, 2014). Therefore, learning communities also became a buzzword for TPD practices in higher education (Cox, 2004; Gomillion et al., 2020; McDonald & Cater-Steel, 2017; Ward & Selvester, 2012). However, critiques and questions regarding the effectiveness of learning communities have been raised (DuFour, 2004; Piggot-Irvine, 2006; Sims & Penny, 2014). Researchers pointed out that an effective learning community requires a culture of collaboration, dedicated time commitment, effective allocation of time, and a broad cover of issues (DuFour, 2004; Sims & Penny, 2014). Time commitment has been identified as a significant barrier to faculty members' participation in TPD in the literature and in this study. This study showed that even the most autonomous group of faculty members resisted committing a significant amount of time to TPD. If faculty members have to invest in community building, they prefer to invest their time in communities related to

their research or communities already in existence, such as their department's faculty, students, and staff. Some faculty members also pointed out allocating faculty members' valuable time on community-building activities is ineffective. Faculty members are more likely to build an effective community with their colleagues through their routine work rather than in a dedicated series of events. TPD practitioners at research universities need to change the structure of TPD to adapt to faculty members' intensive work schedules.

Faculty members are highly independent learners that require a high level of autonomy in their learning process. One could argue that the voluntary basis of TPD at research universities provided faculty members with the autonomy to control the content of their learning. However, many TPDs are offered in formats that center on the TPD presenters instead of the participants, such as a one-hour workshop. This study showed that faculty members value individualized learning and oppose the cookie-cutter format of TPD. TPD practitioners at research universities need to create a collaborative structure of TPD that empowers faculty members during their participation.

Relationship building is a common theme in adult learning at the workplace (Basit et al., 2015; Moch, 1980). Studies have also shown the importance of a positive collegial relationship in the context of higher education (Ponjuan et al., 2011; Velez, 2015). This study confirmed that a positive relationship between faculty members and TPD practitioners could motivate faculty members to participate in TPD. Meantime, a negative relationship with TPD practitioners would immediately terminate faculty members' engagement in TPD. Although the discussion of building credibility among faculty members has emerged in the TPD literature (Cook & Marincovich, 2010), TPD practitioners at research universities need to develop contextualized strategies within their

institutions to consider the faculty members' individual backgrounds, such as career stages, disciplines, and appointment types.

Finally, the culture of research universities significantly influence faculty members' perception of TPD and their participation in TPD, as shown in this study. Baldwin (2005) advocated that the culture in research universities should permeate all aspects of teaching and learning instead of competing with them. However, in reality, most research universities, especially R-1 universities, prioritize research and grants significantly over other tasks, such as teaching. Participant 20's case clearly presented the possible consequences of over-emphasizing research as faculty members' primary duty. The unequal power relations in a department or even a college, such as tenured faculty vs. untenured faculty, could easily eradicate early-career faculty members' passion to pursuit teaching excellence.

When a research university's culture hinders faculty members' participation in TPD, TPD practitioners need to work on systematic strategies that could strengthen the nexus of research and teaching to encourage faculty members' continuous growth towards teaching excellence. For example, fostering and promoting a culture of Scholarship of Teaching and Learning (SoTL) would be effective in bridging the gap between research and teaching. Charlier and Lambert (2020) reported long-term benefits of implementing a SoTL program in a higher education institution, including improving the quality of teaching and learning, increasing collaborative work, and more frequent reflections or revisits to previous teaching practices. By facilitating faculty members' explorations and involvements in the teaching dimension of their disciplines (Bernstein & Ginsberg, 2009), TPD practitioners could strengthen their bonds with faculty members at

research universities and foster an institutional culture that contributes to developing diversified scholarships on campus.

Limitations of the Study

Notably, this study only focused on faculty members from a large COE in one research-I university. Studies in other colleges and disciplines, such as STEM departments in the same research-I university, would most likely produce different results due to different teaching cultures. Similarly, since all research results of this study were drawn from only one research-I university, studies in other research-I universities might have different conclusions due to the variation in different cultural norms.

Critiques of Q methodology often focused on the qualitative aspects of Q. For example, (Kampen & Tamás, 2014) criticized the unclear prescriptions of the concourse development process in the Q literature and the verification of the representativeness of a Q sample drawn from the concourse. The subjectivity of the researcher is another common critique of Q (Kemp et al., 2014; Robbins & Krueger, 2000). In qualitative research, the researcher is often considered as the instrument for data collection and interpretation. Hence, the researcher's personal values and expectations may influence the research agenda and conclusions (Galman, 2016; Maxwell, 2013). The data collection and interpretation phases of Q studies present a similar concern regarding the subjective influence from the researcher. However, using a qualitative lens, if the researcher can appropriately document the rationale for each decision, could mitigate these concerns (Maxwell, 2013). Therefore, an anticipated challenge for this dissertation research was to comprehensively explain my rationale for the concourse development, sample statement selection, data analysis, and interpretation phases I have tried to reduce the risk of my

subjectivity or bias influencing the data interpretation by providing elaborated descriptions of these various study procedures.

Another possible limitation of the study is the selection of participants. Q study does not require a large number of participants since the goal of Q is never to generalize the results to the population (Brown, 1980; Watts & Stenner, 2012). Instead, Q aims to understand the viewpoints of a group of people on a particular topic (McKeown & Thomas, 2013; Watts & Stenner, 2012). However, Watts and Stenner (2012) suggested having "a minimum ratio of two Q-set items to every participant" (p. 72). That means, for a Q-sort with 37 statements, the minimum number of participants for the study should be 18 to 19 faculty members. Unfortunately, due to various reasons, such as the disruption of a global pandemic, I recruited only 17 participants for the Q-sort activity. Although the number of participants was one person below the ideal, the final participants were close to a "balanced and unbiased" group (Watts & Stenner, 2012). Participants covered all nine departments of the college of education and almost all professional rankings from professor to lecturer.

Finally, interview techniques were not included in Stephenson's (1953) methodological framework of Q, but recent Q scholars have widely accepted and acknowledged the value of interviews after the Q-sort activity (Gallagher & Porock, 2010; Shemmings & Ellingsen, 2012). Wolf (2014) explained that the advantage of a F2F immediate post-sorting interview is the ability to gather additional data when "the sorting was fresh for the participants" (p. 8), to "catch an instinct" (p. 9) of participants' rationales, and to provide an opportunity for participants to "launch into long stories that were seasoned with many reflective asides" (p. 10). Although the original plan of the

study included immediate face-to-face interviews with Q-sort participants, the pandemic forced me to pivot to online Q-sorts to avoid in-person contact. I then adapted a web-based questionnaire with open-ended questions to replace F2F interviews. However, I recognized the limitations of a text-based questionnaire compared to a one-on-one post-Q-sort interview format. It is possible I have lost potentially helpful information, such as emotion, tones, and body language due to the limitation of the text-based questionnaire format since most participants did not share rich descriptions of their reflections or rationales. Therefore, I focused more on the factor analysis's results when the participants' perspectives were initially interpreted. Fortunately, I later collected feedback about the accuracy of the initial interpretation through online one-on-one interviews using the Zoom meeting platform, which significantly improved the study's validity.

Recommendations for Future Studies

This Q study revealed interesting findings in terms of the perceptions of faculty members at a large college of education about their participation in voluntary TPD as well as motives for and barriers against their participation. The study aimed to explore and investigate the complexity of motivation in a phenomenological context using self-determination theory. The findings presented here are preliminary and require additional research to supplement and validate the conclusions across the contexts of TPD events.

First, this study was pandemic-influenced research, and data collection was limited to online interaction only. Q studies on TPD that include face-to-face interactions, such as in-person interviews immediately after Q-sorting and focus group discussions for Q analysis results, would likely induce a better understanding of the topic.

The pandemic traumatized the whole world and researchers investigated its influences on all aspects of education, such as digital divide (Ramsetty & Adams, 2020), effective online teaching strategies (Petronzi & Petronzi, 2020), teachers' use of technology (Winter et al., 2021), teacher education (Chatterjee & Parra, 2020), the role of higher education in the future (Neuwirth et al., 2020). More studies on the influence of the COVID-19 pandemic on faculty motivation, beliefs, and practices regarding technology integration and online education would be beneficial.

The findings of this study revealed four distinct faculty profiles regarding the motivation for participation in TPD under the framework of self-determination theory. Most studies of faculty motivation that used SDT focused on the contexts of career success, research productivity, and adoption of innovations. This study added the context of TPD to the existing body of literature on faculty motivation. Future SDT studies in the context of TPD would be helpful in confirming the findings of this study. In addition, this study used a unique mixed-method methodology, Q methodology, to investigate faculty motivation. Future researchers are encouraged to use Q to investigate faculty motivation in various contexts. For example, studies on faculty motivation for participation in TPD in different types of institutions, disciplines, or countries and regions would be beneficial.

This study contributed to the existing literature on faculty development by exploring faculty members' participation in TPD from a psychological stance. In fact, all faculty profiles represented some degree of autonomous motivation for learning, and the word *learner* was the most frequent descriptor for faculty members. The high autonomy concerning learning reflects a significant characteristic of faculty members in the research universities due to the nature of their work, which is to "inquire into the nature

of things" (a quote from the university's mission statement). A finding from this study was that the faculty members showed stronger autonomous motivation when combining teaching practices with research interests. More studies on the design of TPD are needed to leverage the autonomous learning of faculty members. For example, SoTL is an effective model for promoting the teaching-research nexus. Future studies on the effectiveness of SoTL as a TPD model to enhance faculty motivation for participation would benefit the field.

Also, this study showed that the relationship between participants and TPD presenters and leaders can be a significant determinant in the subsequent behaviors of faculty members regarding their participation in TPD. Current research on interpersonal relationships has a narrow focus on effective models and strategies that could help TPD leaders create and maintain positive relationships with faculty members. Future studies on factors that determine a trust relationship and positive social interaction between TPD leaders and faculty members would be beneficial.

The results of this study also questioned existing studies that promote teaching communities. This study found that joining a teaching community was not a shared interest among faculty members. Faculty members were commonly concerned about the time they needed to invest in engaging in a teaching community. Instead of allocating a dedicated period of time for community building, many faculty participants described their ideal community building as collaboratively working on the same task in their daily work. Many faculty members strongly resisted a long-term commitment to TPD activities, such as community building. Future studies on effective models of community building in flexible formats would be beneficial.

Moreover, this study presented controversial results of the effectiveness of financial incentives in terms of faculty motivation for participation in TPD. Faculty members had very different opinions about the offering of monetary rewards for their participation in TPD. It was unclear how much of a stipend would be sufficient to motivate typical faculty members to participate in TPD without significantly diminishing their autonomous motivation. Future studies on the format of rewards for participation in TPD would be beneficial.

Finally, faculty participants pointed out that the departmental level of encouragement and acknowledgment for participation in TPD was very influential. For example, if the department chair calls for participation in TPD or emphasizes the significance of TPD, then faculty members in the department would be more inclined to participate. Future studies on the role of local administrators, such as department chairs, regarding participation in TPD would be beneficial.

Conclusion

Engaging faculty members at research universities to participate in voluntary TPD requires a joint effort of all stakeholders, including administrators (e.g., department chairs and deans), TPD practitioners, and faculty members. In response to the institutional challenges of the 21st century, research universities need a sustainable plan for faculty members' learning and growth to achieve teaching excellence. The goal of TPD should also align with the strategic plan of the institution to provide effective and sustainable support for faculty members at research universities. The increased diversity of the student population in higher education requires faculty members to obtain new sets of skills, such as the ability to teach online. TPD practitioners are encouraged to create a

large and balanced menu of TPD activities to satisfy the needs of faculty members at different career stages and in various disciplines. More studies on related topics are needed to propose innovative solutions and strategies for TPD practices at research universities.

REFERENCES

Alleman, N. F., Holly, L. N., & Costello, C. A. (2013). Leveraging a new building to overcome first and second-order barriers to faculty technology integration. *Journal of Learning Spaces*, *2*(1), Article 1. http://libjournal.uncg.edu/jls/article/view/381

Almazova, N., Krylova, E., Rubtsova, A., & Odinokaya, M. (2020). Challenges and opportunities for Russian higher education amid COVID-19: Teachers' perspective. *Education Sciences*, *10*(12), 368. https://doi.org/10.3390/educsci10120368

Alpay, E., & Jones, M. E. (2011). Strengths and weaknesses of teaching in research intensive universities. In J. Bernardino & J. C. Quadrado (Eds.), *WEE2011* (pp. 185–190). http://epubs.surrey.ac.uk/838454/

Amin, Z. (2000). Q methodology – A journey into the subjectivity of human mind. *Singapore Medical Journal*, *41*(8), 410–414.

Andersen, R. H., Schulze, J. L., & Seppel, K. (2018). Pinning down democracy: A Q-Method study of lived democracy. *Polity*, *50*(1). https://qmethod.org/2018/01/09/pinning-down-democracy-a-q-method-study-of-lived-democracy/

Anderson, D. M., & Slade, C. P. (2016). Managing Institutional Research Advancement: Implications from a University Faculty Time Allocation Study. *Research in Higher Education*, *57*(1), 99–121. https://doi.org/10.1007/s11162-015-9376-9

Anfara Jr., V. (2008). Visual data displays. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods* (pp. 931–934). SAGE.

Austin, A. E., & Sorcinelli, M. D. (2013). The future of faculty development: Where are we going? *New Directions for Teaching and Learning*, *133*, 85–97. https://doi.org/10.1002/tl.20048

Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and Teacher Education*, *27*(1), 10–20. https://doi.org/10.1016/j.tate.2010.08.007

Baldwin, G. (2005). *The teaching-research nexus: How research informs and enhances learning and teaching in the University of Melbourne*. University of Melbourne.

Baldwin, R. (1998). Technology's impact on faculty life and work. *New Directions for Teaching and Learning*, *1998*(76), 7–21. https://doi.org/10.1002/tl.7601

Banasick, S. (2015). *Easy-HTMLQ* (1.0.4) [Computer Software]. https://github.com/shawnbanasick/easy-htmlq

Banasick, S. (2018). *Ken-Q analysis: A web application for Q methodology* (0.11.1) [Web Application]. https://shawnbanasick.github.io/ken-q-analysis-beta/index.html#section1

Basit, T. N., Eardley, A., Borup, R., Shah, H., Slack, K., & Hughes, A. (2015). Higher education institutions and work-based learning in the UK: Employer engagement within a tripartite relationship. *Higher Education*, *70*(6), 1003–1015. https://doi.org/10.1007/s10734-015-9877-7

Bastedo, M., Altbach, P., & Gumport, P. (Eds.). (2016). *American higher education in the twenty-first century: Social, political, and economic challenges* (4th ed.). Johns Hopkins University Press.

Beach, A. L., Sorcinelli, M. D., Austin, A. E., & Rivard, J. K. (2016). *Faculty development in the age of evidence: Current practices, future Imperatives*. Stylus Publishing, LLC.

Belland, B. R. (2009). Using the theory of habitus to move beyond the study of barriers to technology integration. *Computers & Education, 52*(2), 353–364. https://doi.org/10.1016/j.compedu.2008.09.004

Berger, P., & Luckmann, T. (1967). *The social construction of reality: A treatise in the sociology of knowledge*. Anchor Books.

Bernstein, J. L., & Ginsberg, S. M. (2009). Toward an Integrated Model of the Scholarship of Teaching and Learning and Faculty Development. *Journal on Centers for Teaching and Learning*, *1*. https://openjournal.lib.miamioh.edu/index.php/jctl/article/view/102

Bland, C. J., Center, B. A., Finstad, D. A., Risbey, K. R., & Staples, J. (2006). The impact of appointment type on the productivity and commitment of full-time faculty in research and doctoral institutions. *The Journal of Higher Education, 77*(1), 89–123.

Blin, F., & Munro, M. (2008). Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory. *Computers & Education*, *50*(2), 475–490. https://doi.org/10.1016/j.compedu.2007.09.017

Borland, K. (1991). That's not what I said: Interpretive conflict in oral narrative research. In S. B. Gluck & D. Patai (Eds.), *Women's words: The Feminist practice of oral history* (pp. 63–75). Routledge.

Bouwma-Gearhart, J. (2012). Research University STEM Faculty Members' Motivation to Engage in Teaching Professional Development: Building the Choir Through an Appeal to Extrinsic Motivation and Ego. *Journal of Science Education and Technology*, *21*(5), 558–570. https://doi.org/10.1007/s10956-011-9346-8

Boyer, E. L. (1990). *Scholarship reconsidered: Priorities of the professoriate*. The Carnegie Foundation for the Advancement of Teaching. https://www.jstor.org/stable/10.2307/40250362?origin=crossref

Braito, M., Leonhardt, H., Penker, M., Schauppenlehner-Kloyber, E., Thaler, G., & Flint, C. G. (2020). The plurality of farmers' views on soil management calls for a policy mix. *Land Use Policy*, *99*, 104876. https://doi.org/10.1016/j.landusepol.2020.104876

Brown, M., McCormack, M., Reeves, J., Brooks, C., Grajek, S., Alexander, B., Bali, M., Bulger, S., Dark, S., Engelbert, N., Gannon, K., Gauthier, A., Gibson, D., Gibson, R., Lundin, B., Veletsianos, G., & Weber, N. (2020). *2020 EDUCAUSE horizon report: Teaching and learning edition* (p. 58). EDUCAUSE. https://www.educause.edu/horizon-report-2020

Brown, S. (1980). *Political subjectivity: Applications of Q methodology in political science*. Yale University Press.

Brown, S. (1993). A primer on Q methodology. *Operant Subjectivity*, *16*(3/4), 91–138. https://doi.org/10.15133/j.os.1993.002

Brown, S. (1996). Q methodology and qualitative research. *Qualitative Health Research*, *6*(4), 561–567. https://doi.org/10.1177/104973239600600408

Brown, S. (2017). More than just a research tool: A comment on “An overview of the statistical techniques in Q methodology.” *Operant Subjectivity*, *38*(3/4), 37–41. https://doi.org/10.15133/j.os.2016.008

Brown, S. (2019). Q methodology in research on political decision making. In D. Redlawsk (Ed.), *Oxford Research Encyclopedia of Politics*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190228637.013.980

Brown, S., Danielson, S., & van Exel, J. (2015). Overly ambitious critics and the Medici Effect: A reply to Kampen and Tamás. *Quality & Quantity*, *49*(2), 523–537. https://doi.org/10.1007/s11135-014-0007-x

Burdick, D., Doherty, T., & Schoenfeld, N. (2015). Encouraging Faculty Attendance at Professional Development Events. *To Improve the Academy*, *34*(1–2), 367–405. https://doi.org/10.1002/tia2.20019

Burnstad, H., & Hoss, C. (2010). Faculty development in the context of the community college. In *A guide to faculty development* (2nd ed., pp. 309–326). Jossey-Bass.

Canale, A. M., Herdklotz, C., & Wild, L. (2014). *Faculty needs survey*.

Carlson, J. A. (2010). Avoiding traps in member checking. *The Qualitative Report*, *15*(5), 1102–1113.

Case, J. (2015). Knowledge for teaching, knowledge about teaching: Exploring the links between education research, scholarship of teaching and learning (SOTL) and scholarly teaching. *Journal of Education, 61*, 53–71.

Castillo, J. X., & Cano, J. (2004). Factors explaining job satisfaction among faculty. *Journal of Agricultural Education*, *45*(3), 65–74. https://doi.org/10.5032/jae.2004.03065

Chalmers, D. (2011). Progress and challenges to the recognition and reward of the Scholarship of Teaching in higher education. *Higher Education Research & Development*, *30*(1), 25–38. https://doi.org/10.1080/07294360.2011.536970

Charlier, B., & Lambert, M. (2020). Evaluating the effects of faculty development: Theoretical framework and empirical implementation. *International Journal for Academic Development*, *25*(2), 162–175. https://doi.org/10.1080/1360144X.2019.1659798

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). SAGE.

Chatterjee, S., & Parra, J. (2020). *Innovative design revisions on an undergraduate technology integration course for K-12 preservice teachers* (pp. 331–441).

Chen, J. F., Warden, C. A., & Chang, H.-T. (2005). Motivators that do not motivate: The case of Chinese EFL learners and the influence of culture on motivation. *TESOL Quarterly*, *39*(4), 609. https://doi.org/10.2307/3588524

Chiasson, K., Terras, K., & Smart, K. (2016). Faculty perceptions of moving a face-to-face course to online instruction. *Journal of College Teaching & Learning (TLC)*, *12*(3), 321. https://doi.org/10.19030/tlc.v12i3.9315

Cohen, M. (2010). Listen, learn, lead: Getting started in faculty development. In *A guide to faculty development* (2nd ed., pp. 67–81). Jossey-Bass.

Colbeck, C. L. (1998). Merging in a Seamless Blend: How Faculty Integrate Teaching and Research. *The Journal of Higher Education*, *69*(6), 647–671. https://doi.org/10.1080/00221546.1998.11780746

Colwell, J., & Hutchison, A. (2018). Considering a Twitter-based professional learning network in literacy education. *Literacy Research and Instruction*, *57*(1), 5–25. https://doi.org/10.1080/19388071.2017.1370749

Colwell, J., Hutchison, A. C., & Reinking, D. (2012). Using blogs to promote literary response during professional development. *Language Arts*, *89*(4), 14.

Connelly, L. M. (2016). Trustworthiness in qualitative research. *Medsurg Nursing*, *25*(6), 435–436.

Coogan, J., & Herrington, N. (2011). Q methodology: An overview. *Research In Secondary Teacher Education*, *1*(2), 24–28.

Cook, C. E., & Marincovich, M. (2010). Effective practices at research universities: The productive pairing of research and teaching. In K. J. Gillespie & D. L. Robertson (Eds.), *A guide to faculty development* (2nd ed., Vol. 1–21, pp. 277–292). Jossey-Bass.

Cope, D. G. (2014). Methods and meanings: Credibility and trustworthiness of qualitative research. *Oncology Nursing Forum*, *41*(1), 89–91. https://doi.org/10.1188/14.ONF.89-91

Cox, M. D. (2004). Introduction to faculty learning communities. *New Directions for Teaching & Learning*, *2004*(97), 5–23. https://doi.org/10.1002/tl.129

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice*, *39*(3), 124–130.

Dahlstrom, E. (2015). *Educational technology and faculty development in higher education*. EDUCAUSE Center for Analysis and Research.

deCharms, R. (1981). Personal causation and locus of control: Two different traditions and two uncorrelated measures. In H. M. Lefcourt (Ed.), *Research with the Locus of Control Construct: Vol. Assessment Methods* (pp. 337–358). Academic Press.

Deci, E. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, *18*(1), 105–115. https://doi.org/10.1037/h0030644

Deci, E. (1975). *Intrinsic motivation* (pp. xi, 324). Plenum Press. https://doi.org/10.1007/978-1-4613-4446-9

Deci, E., & Ryan, R. (1980). The empirical exploration of intrinsic motivational. *Advances in Experimental Social Psychology*, *13*, 39–80. https://doi.org/10.1016/S0065-2601(08)60130-6

Deci, E., & Ryan, R. (1985a). *Intrinsic motivation and self-determination in human behavior*. Springer US. https://doi.org/10.1007/978-1-4899-2271-7

Deci, E., & Ryan, R. (1985b). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, *19*(2), 109–134. https://doi.org/10.1016/0092-6566(85)90023-6

Deci, E., & Ryan, R. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Deci, E., & Ryan, R. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne, 49*(3), 182–185. https://doi.org/10.1037/a0012801

Donner, J. (2001). Using Q-sorts in participatory processes: An introduction to the methodology. In R. A. Krueger, M. A. Casey, J. Donner, S. Kirsch, & J. N. Maack (Eds.), *Social analysis: Selected tools and techniques* (pp. 24–49). The World Bank. https://doi.org/10.2165/00019053-200725120-00005

Doyle, S. (2007). Member checking with older women: A framework for negotiating meaning. *Health Care for Women International, 28*(10), 888–908. https://doi.org/10.1080/07399330701615325

DuFour, R. (2004). What is a professional learning community? *Educational Leadership, 61*(8), 6–11.

Durrer, V., Kelly, G., McKnight, M., & Schubotz, D. (2020). Exploring young people's understanding of culture: A study from Northern Ireland. *Cultural Trends, 29*(1), 4–18. https://doi.org/10.1080/09548963.2019.1692184

Dweck, C. (2006). *Mindset: The new psychology of success*. Random House.

Dweck, C. (2016). *Mindset: The new psychology of success: How we can learn to fulfill our potential* (Updated). Random House.

Dyrberg, N. R., & Holmegaard, H. T. (2019). Motivational patterns in STEM education: A self-determination perspective on first year courses. *Research in Science & Technological Education, 37*(1), 90–109. https://doi.org/10.1080/02635143.2017.1421529

Dysart, S., & Weckerle, C. (2015). Professional development in higher education: A model for meaningful technology integration. *Journal of Information Technology Education: Innovations in Practice, 14*, 255–265. https://doi.org/10.28945/2326

EDUCAUSE. (2019). *EDUCAUSE Learning Initiative Key Issues results all years*. Google Spreadsheet. https://docs.google.com/spreadsheets/d/1yhl6A7YaqZyoJ-PK7JPMFosEquNeWZPcPDfAEo_fs6I/edit?usp=sharing&usp=embed_facebook

Ellingsen, I. T., Thorsen, A. A., & Størksen, I. (2014). Revealing children's experiences and emotions through Q methodology. *Child Development Research*, *2014*(June), 1–9. https://doi.org/10.1155/2014/910529

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, *4*(1), 2158244014522633. https://doi.org/10.1177/2158244014522633

Ersanli, C. Y. (2016). Improving Technological Pedagogical Content Knowledge (TPACK) of pre-service English language teachers. *International Education Studies*, *9*(5), 18. https://doi.org/10.5539/ies.v9n5p18

Ertmer, P. A. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development, 47*(4), 47–61. https://doi.org/10.1007/BF02299597

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

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture Intersect. *Journal of Research on*

Technology in Education, *42*(3), 255–284. https://doi.org/10.1080/15391523.2010.10782551

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

Ewell, P. (2013). The new "ecology" for higher education: Challenges to accreditation. *The Changing Ecology of Higher Education and Its Impact on Accreditation*. WASC.

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the Technology Acceptance Model (TAM) to examine faculty use of Learning Management Systems (LMSs) in higher education institutions. *Journal of Online Learning and Teaching*, *11*(2), 23.

Ferguson, P. (2004). *Faculty beliefs about teaching with technology*. *27*, 155–166.

Flavin, M. (2012). Disruptive technologies in higher education. *Research in Learning Technology*, *20*(sup1), 19184. https://doi.org/10.3402/rlt.v20i0.19184

Fothergill, A., & Feltey, K. (2003). "I've worked very hard and slept very little" Mothers on the tenure track in academia. *Journal of the Association for Research on Mothering*, *5*(2), 7–19.

Gaff, J. G., & Simpson, R. D. (1994). Faculty development in the United States. *Innovative Higher Education*, *18*(3), 167–176. https://doi.org/10.1007/BF01191111

Gallagher, K., & Porock, D. (2010). The use of interviews in Q methodology: Card content analysis. *Nursing Research*, *59*(4), 295–300. https://doi.org/10.1097/NNR.0b013e3181e4ffff

Galman, S. (2016). *The good, the bad, and the data: Shane the lone ethnographer's basic guide to qualitative data analysis*. Routledge.

García, E., & Weiss, E. (2019). *The role of early career supports, continuous professional development, and learning communities in the teacher shortage* (No. 5; The Perfect Storm in the Teacher Labor Market). Economic Policy Institute. https://epi.org/164976

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What Makes Professional Development Effective? Results From a National Sample of Teachers. *American Educational Research Journal*, *38*(4), 915–945. https://doi.org/10.3102/00028312038004915

Geertz, C. (1966). The Impact of the Concept of Culture on the Concept of Man. *Bulletin of the Atomic Scientists*, *22*(4), 2–8. https://doi.org/10.1080/00963402.1966.11454918

Geertz, C. (1975). Common Sense as a Cultural System. *The Antioch Review*, *33*(1), 5. https://doi.org/10.2307/4637616

Gilbert, S. W. (1996). Making the most of a slow revolution. *Change: The Magazine of Higher Learning*, *28*(2), 10–23. https://doi.org/10.1080/00091383.1996.9937745

Gillespie, K. J., & Robertson, D. L. (Eds.). (2010). *A guide to faculty development* (2nd ed.). Jossey-Bass.

Gladwin, M., McDonald, G., & McKay, J. (2014). Conversations with professors: An exploration of academic career success. *Higher Education Review*, *46*(3), 26–51.

Gomillion, D., Becker, A., George, J., & Scialdone, M. (2020). Learning how to teach: The case for faculty learning communities. *Information Systems Education Journal*, *18*(4), 74–79.

Grant, A. M., & Shin, J. (2012). Work Motivation: Directing, Energizing, and Maintaining Effort (and Research). In R. M. Ryan (Ed.), *The Oxford Handbook of Human Motivation* (pp. 504–519). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195399820.013.0028

Green, K. C. (1996). The coming ubiquity of information technology. *Change: The Magazine of Higher Learning*, *28*(2), 24–28. https://doi.org/10.1080/00091383.1996.9937746

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). SAGE Publications.

Gupta, A., & Ferguson, J. (1992). Beyond "culture": Space, identity, and the politics of difference. *Cultural Anthropology*, *7*(1), 6–23.

Hale-Benson, J. E. (1986). *Black children: Their roots, culture, and learning styles* (Revised). Johns Hopkins University Press.

Hansen, H. (2008). Abduction. In D. Barry & H. Hansen (Eds.), *The SAGE handbook of new approaches in management and organization* (p. 457). SAGE.

Hardré, P. L. (2003). Beyond two decades of motivation: A review of the research and practice in instructional design and human performance technology. *Human*

Resource Development Review, *2*(1), 54–81. https://doi.org/10.1177/1534484303251661

Hechter, R. P., & Vermette, L. A. (2013). Technology integration in K-12 science classrooms: An analysis of barriers and implications. *Themes in Science and Technology Education*, *6*(2), 73–90.

Heider, F. (1958). *The psychology of interpersonal relations*. Psychology Press.

Herman, J. H. (2012). Faculty development programs: The frequency and variety of professional development programs available to online instructors. *Online Learning*, *16*(5). https://doi.org/10.24059/olj.v16i5.282

Hines, S. R. (2017). Evaluating Centers for Teaching and Learning: A Field-Tested Model. *To Improve the Academy*, *36*(2), 89–100. https://doi.org/10.1002/tia2.20058

Hon, A. H. Y., & Leung, A. S. M. (2011). Employee Creativity and Motivation in the Chinese Context: The Moderating Role of Organizational Culture. *Cornell Hospitality Quarterly*, *52*(2), 125–134. https://doi.org/10.1177/1938965511403921

Hooper, S., & Rieber, L. (1995). Teaching with technology. In *Teaching: Theory into practice* (pp. 154–170). Allyn and Bacon.

Hu, C., & Galstaun, V. (2021). *Impact of a new curriculum on pre-service teachers' Technical, Pedagogical and Content Knowledge (TPACK)*.

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development*, *58*(2), 137–154. https://doi.org/10.1007/s11423-009-9132-y

Jafri, M. H. (2010). Organizational Commitment and Employee's Innovative Behavior. *Journal of Management Research*, *10*(1), 8.

Johnson, T., Wisniewski, M. A., Kuhlemeyer, G., Isaacs, G., & Krzykowski, J. (2012). Technology Adoption in Higher Education: Overcoming Anxiety Through Faculty Bootcamp. *Online Learning*, *16*(2). https://doi.org/10.24059/olj.v16i2.240

Jumonville, A. (2014). The role of faculty autonomy in a course-integrated information literacy program. *Reference Services Review*, *42*(4), 536–551. https://doi.org/10.1108/RSR-07-2014-0020

Kampen, J. K., & Tamás, P. (2014). Overly ambitious: Contributions and current status of Q methodology. *Quality and Quantity*, *48*(6), 3109–3126. https://doi.org/10.1007/s11135-013-9944-z

Kellner, D. (2003). *Media culture: Cultural studies, identity and politics between the modern and the post-modern*. Routledge.

Kemp, A. T., Preston, J., Page, C. S., Harper, R., Dillard, B., & Flynn, J. (2014). Technology and teaching: A conversation among faculty regarding the pros and cons of technology. *The Qualitative Report*, *19*(September), 1–23.

Kenney, J. L., Banerjee, P., & Newcombe, E. (2010). Developing and sustaining positive change in faculty technology skills: Lessons learned from an innovative faculty development initiative. *International Journal of Technology in Teaching and Learning*, *6*, 89–102.

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, *29*, 76–85. https://doi.org/10.1016/j.tate.2012.08.005

Kinuthia, W. (2005). Planning faculty development for successful implementation of web-based instruction. *Campus-Wide Information Systems*, *22*(4), 189–200. https://doi.org/10.1108/10650740510617502

Knight, P. (1998). Professional Obsolescence and Continuing Professional Development in Higher Education. *Innovations in Education and Training International*, *35*(3), 248–256. https://doi.org/10.1080/1355800980350309

Knowles, M. S. (1973). *The adult learner: A neglected species*. Gulf.

Koehler, M., & Mishra, P. (2009). What is Technological Pedagogical Content Knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60–70.

Kopcha, T. J. (2010). A systems-based approach to technology integration using mentoring and communities of practice. *Educational Technology Research and Development*, *58*(2), 175–190. https://doi.org/10.1007/s11423-008-9095-4

Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, *59*(4), 1109–1121. https://doi.org/10.1016/j.compedu.2012.05.014

Kopcha, T. J., Rieber, L. P., & Walker, B. B. (2016). Understanding university faculty perceptions about innovation in teaching and technology: Faculty perceptions about innovation. *British Journal of Educational Technology*, *47*(5), 945–957. https://doi.org/10.1111/bjet.12361

Kposowa, A. J., & Valdez, A. D. (2013). Student Laptop Use and Scores on Standardized Tests. *Journal of Educational Computing Research*, *48*(3), 345–379. https://doi.org/10.2190/EC.48.3.d

Lassander, M., & Nynäs, P. (2016). Contemporary fundamentalist Christianity in Finland: The variety of religious subjectivities and their association with values. *Interdisciplinary Journal for Religion and Transformation in Contemporary Society*, *2*(2), 154–184. https://doi.org/10.14220/jrat.2016.2.2.154

Lechuga, V. M. (2012). Latino faculty in STEM disciplines: Motivation to engage in research activities. *Journal of Latinos and Education*, *11*(2), 107–123. https://doi.org/10.1080/15348431.2012.659564

Lechuga, V. M. (2014). A motivation perspective on faculty mentoring: The notion of "non-intrusive" mentoring practices in science and engineering. *Higher Education*, *68*(6), 909–926. https://doi.org/10.1007/s10734-014-9751-z

Lei, J., & Zhao, Y. (2007). Technology uses and student achievement: A longitudinal study. *Computers & Education*, *49*(2), 284–296. https://doi.org/10.1016/j.compedu.2005.06.013

Lewis, C. C., Fretwell, C. E., Ryan, J., & Parham, J. B. (2013). Faculty use of established and emerging technologies in higher education: A unified theory of acceptance and use of technology perspective. *International Journal of Higher Education*, *2*(2), 22–34. https://doi.org/10.5430/ijhe.v2n2p22

Lewis, K. G. (1996). Faculty development in the United States: A brief history. *International Journal for Academic Development*, *1*(2), 26–33. https://doi.org/10.1080/1360144960010204

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (1st ed.). SAGE Publications.

Lockyer, S. (2008). Qualitative research, history of. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods* (pp. 707–711). SAGE. https://doi.org/10.4135/9781412963909.n357

Lowenthal, P. R., Wray, M. L., Bates, B., Switzer, T., & Stevens, E. (2012). Examining faculty motivation to participate in faculty development. *International Journal of University Teaching and Faculty Development*, *3*(3), 149–164.

Lowther, D. L., Inan, F. A., Daniel Strahl, J., & Ross, S. M. (2008). Does technology integration "work" when key barriers are removed? *Educational Media International*, *45*(3), 195–213. https://doi.org/10.1080/09523980802284317

Lutfallah, S., & Buchanan, L. (2019). Quantifying subjective data using online Q-methodology software. *The Mental Lexicon*, *14*(3), 415–423. https://doi.org/10.1075/ml.20002.lut

Maor, D. (2017). Using TPACK to develop digital pedagogues: A higher education experience. *Journal of Computers in Education*, *4*(1), 71–86. https://doi.org/10.1007/s40692-016-0055-4

Marinak, B. A., & Gambrell, L. B. (2008). Intrinsic motivation and rewards: What sustains young children's engagement with text? *Literacy Research and Instruction*, *47*(1), 9–26. https://doi.org/10.1080/19388070701749546

Matusovich, H. M., Paretti, M. C., McNair, L. D., & Hixson, C. (2014). Faculty Motivation: A Gateway to Transforming Engineering Education: Faculty Motivation As a Gateway to Transformation. *Journal of Engineering Education, 103*(2), 302–330. https://doi.org/10.1002/jee.20044

Maxwell, J. A. (2013). Qualitative research design: An interactive approach. In *Qualitative research design: An interactive approach* (3rd ed.). SAGE. https://doi.org/10.1007/s13398-014-0173-7.2

McBride, K. (2010). Leadership in higher education: Handling faculty resistance to technology through strategic planning. *Academic Leadership: The Online Journal*, *8*(4), 13.

McDonald, J., & Cater-Steel, A. (Eds.). (2017). *Communities of Practice: Facilitating Social Learning in Higher Education*. Springer Singapore. https://doi.org/10.1007/978-981-10-2879-3

McGrath, J., Karabas, G., & Willis, J. (2010). From TPACK concept to TPACK practice: An analysis of the suitability and usefulness of the concept as a guide in the real world of teacher development. *International Journal of Technology in Teaching and Learning*, *7*(1), 1–23.

McKeown, B., & Thomas, D. (2013). *Q methodology* (2nd ed., Vol. 1–66). SAGE. https://us.sagepub.com/en-us/nam/q-methodology/book238928

Meyer, K. A., & Murrell, V. (2014). A national study of training content and activities for faculty development for online teaching. *Journal of Asynchronous Learning Networks*, *18*(1). https://doi.org/10.24059/olj.v18i1.355

Miller, A. N., Taylor, S. G., & Bedeian, A. G. (2011). Publish or perish: Academic life as management faculty live it. *Career Development International*, *16*(5), 422–445. https://doi.org/10.1108/13620431111167751

Miller-Young, J. E., Yeo, M., & Manarin, K. (2018). Challenges to disciplinary knowing and identity: Experiences of scholars in a SoTL development program.

International Journal for the Scholarship of Teaching and Learning, *12*(1). https://doi.org/10.20429/ijsotl.2018.120103

Moch, M. K. (1980). Job involvement, internal motivation, and employees' integration into networks of work relationships. *Organizational Behavior and Human Performance*, *25*(1), 15–31. https://doi.org/10.1016/0030-5073(80)90023-9

Moralista, R. B., & F. Oducado, R. M. (2020). Faculty perception toward online education in a state college in the Philippines during the Coronavirus Disease 19 (COVID-19) pandemic. *Universal Journal of Educational Research*, *8*(10), 4736–4742. https://doi.org/10.13189/ujer.2020.081044

Morzinski, J. A., & Fisher, J. C. (2002). A nationwide study of the influence of faculty development programs on colleague relationships. *Academic Medicine*, *77*(5), 402–406. https://doi.org/10.1097/00001888-200205000-00010

Mouza, C. (2009). Does research-based professional development make a difference? A longitudinal investigation of teacher learning in technology integration. *Teachers College Record*, *111*(5), 1195–1241.

Neuwirth, L. S., Jović, S., & Mukherji, B. R. (2020). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education*, 1477971420947738. https://doi.org/10.1177/1477971420947738

Newman, H. (2002). *Computers used more to learn than teach*. Detroit Free Press.

North, J., & Scholl, S. C. (1979). POD: The founding of a national network. *POD Quarterly: The Journal of the Professional and Organizational Development Network in Higher Education*, *1*(1), 10–17.

Nynäs, P., Kontala, J., & Lassander, M. (2021). The faith Q-Sort: In-Depth assessment of diverse spirituality and religiosity in 12 countries. In A. L. Ai, P. Wink, R. F. Paloutzian, & K. A. Harris (Eds.), *Assessing spirituality in a diverse world* (pp. 553–573). Springer International Publishing. https://doi.org/10.1007/978-3-030-52140-0_22

O'Connell, N. B., Dempsey, M., & O'Shea, A. (2019). An investigation of students' attitudes to science, mathematics and the use of technology in lower secondary education. *International Journal of Education in Mathematics, Science and Technology, 7*(4), 319–334.

Ottenbreit-Leftwich, A. T., Glazewski, K. D., Newby, T. J., & Ertmer, P. A. (2010). Teacher value beliefs associated with using technology: Addressing professional and student needs. *Computers & Education*, *55*(3), 1321–1335. https://doi.org/10.1016/j.compedu.2010.06.002

Ouellett, M. (2010). Overview of faculty development: History and choices. In K. J. Gillespie & D. L. Robertson (Eds.), *A guide to faculty development* (2nd ed., pp. 3–20). Jossey-Bass.

Owen, S. (2014). Teacher professional learning communities: Going beyond contrived collegiality toward challenging debate and collegial learning and professional growth. *Australian Journal of Adult Learning*, *54*(2), 54–77.

O'Sullivan, P. S., & Irby, D. M. (2011). Reframing research on faculty development. *Academic Medicine*, *86*(4), 421–428. https://doi.org/10.1097/ACM.0b013e31820dc058

Padgett, D. L., & Conceição-Runlee, S. (2000). Designing a Faculty Development Program on Technology: If you Build it, will they Come? *Journal of Social Work Education*, *36*(2), 325–334. https://doi.org/10.1080/10437797.2000.10779011

Paige, J. B., & Morin, K. H. (2016). Q-sample construction: A critical step for a Q-methodological study. *Western Journal of Nursing Research*, *38*(1), 96–110. https://doi.org/10.1177/0193945914545177

Park, R. (1979). Faculty development: An historical perspective. *POD Quarterly: The Journal of the Professional and Organizational Development Network in Higher Education*, *1*(1), 24–32.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). SAGE.

Perna, L. W., & Ruiz, R. (2016). Technology: The solution to higher education's pressing problems? In *American higher education in the twenty-first century: Social, political, and economic challenges* (4th ed., pp. 432–461). Johns Hopkins University Press.

Petronzi, D., & Petronzi, R. (2020). The Online and Campus (OaC) model as a sustainable blended approach to teaching and learning in higher education: A response to COVID-19. *Journal of Pedagogical Research*, *4*(4), 498–507. https://doi.org/10.33902/JPR.2020064475

Phillips, J. A., Schumacher, C., & Arif, S. (2016). Time spent, workload, and student and faculty perceptions in a blended learning environment. *American Journal of Pharmaceutical Education*, *80*(6).

Piggot-Irvine, E. (2006). Sustaining excellence in experienced principals? Critique of a professional learning community approach. *International Electronic Journal for Leadership Learning*, *10*(16).

POD Network. (2021, January 1). *Centers and programs directory*. POD Network: Professional and Organizational Development Network in Higher Education. https://podnetwork.org/centers-programs/

Ponjuan, L., Conley, V. M., & Trower, C. (2011). Career stage differences in pre-tenure track faculty perceptions of professional and personal relationships with colleagues. *The Journal of Higher Education*, *82*(3), 319–346. https://doi.org/10.1353/jhe.2011.0015

Potter, M. K., & Kustra, E. (2011). The Relationship between Scholarly Teaching and SoTL: Models, Distinctions, and Clarifications. *International Journal for the Scholarship of Teaching and Learning*, *5*(1). https://doi.org/10.20429/ijsotl.2011.050123

Ramlo, S. (2016). Mixed method lessons learned from 80 years of Q methodology. *Journal of Mixed Methods Research*, *10*(1), 28–45. https://doi.org/10.1177/1558689815610998

Ramlo, S. (2017). Student views regarding online freshmen physics courses. *Research in Science & Technological Education*, *35*(4), 461–476. https://doi.org/10.1080/02635143.2017.1353961

Ramlo, S., & Newman, I. (2011). Q methodology and its position in the mixed-methods continuum. *Operant Subjectivity: The International Journal of Q Methodology*, *34*(3), 172–191.

Ramlo, S. (2021). The coronavirus and higher education: Faculty viewpoints about universities moving online during a worldwide pandemic. *Innovative Higher Education*, *46*(3), 241–259. https://doi.org/10.1007/s10755-020-09532-8

Ramsetty, A., & Adams, C. (2020). Impact of the digital divide in the age of COVID-19. *Journal of the American Medical Informatics Association*, *27*(7), 1147–1148. https://doi.org/10.1093/jamia/ocaa078

Reder, M. (2010). Effective practices in the context of small colleges. In *A guide to faculty development* (2nd ed., pp. 293–308). Jossey-Bass.

Reichertz, J. (2007). Abduction: The logic of discovery of Grounded Theory. In A. Bryant & K. Charmaz (Eds.), *The SAGE handbook of Grounded Theory* (pp. 214–228). SAGE Publications. https://doi.org/10.4135/9781848607941.n10

Rice, R. E., Sorcinelli, M. D., & Austin, A. E. (2000). *Heeding new voice: Academic careers for a new generation* (Collected Works Inquiry #7; Working Paper Series: New Pathways: Faculty Careers and Employment for the 21st Century, p. 59). American Association for Higher Education.

Rieber, L. P. (2019). *Lloyd's Q sort tool* (1.8.1) [Computer Software]. http://nowhereroad.com/qsort/download.html

Rieber, L. P. (2020). Q methodology in learning, design, and technology: An introduction. *Educational Technology Research and Development*, *68*(5), 2529–2549. https://doi.org/10.1007/s11423-020-09777-2

Robbins, P., & Krueger, R. (2000). Beyond bias? The promise and limits of Q method in human geography. *The Professional Geographer*, *52*(4), 636–648. https://doi.org/10.1111/0033-0124.00252

Robert, J., & Carlsen, W. S. (2017). Teaching and research at a large university: Case studies of science professors. *Journal of Research in Science Teaching*, *54*(7), 937–960. https://doi.org/10.1002/tea.21392

Robertson, D. L. (2010). Establishing an educational development program. In K. J. Gillespie & D. L. Robertson (Eds.), *A guide to faculty development* (2nd ed., p. 18). Jossey-Bass.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Ross, M., Karniol, R., & Rothstein, M. (1976). Reward contingency and intrinsic motivation in children: A test of the delay of gratification hypothesis. *Journal of Personality and Social Psychology*, *33*(4), 442–447. https://doi.org/10.1037/0022-3514.33.4.442

Rosser, V. J., & Tabata, L. N. (2010). An Examination of Faculty Work: Conceptual and Theoretical Frameworks in the Literature. In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research* (Vol. 25, pp. 449–475). Springer Netherlands. https://doi.org/10.1007/978-90-481-8598-6_12

Roulston, K. (2010). *Reflective interviewing: A guide to theory and practice*. SAGE. https://doi.org/10.4135/9781446288009

Rudolph, F. (1977). *Curriculum. A history of the American undergraduate course of study since 1636*. Jossey-Bass.

Rutz, C., Condon, W., Iverson, E. R., Manduca, C. A., & Willett, G. (2012). Faculty Professional Development and Student Learning: What is the Relationship? *Change: The Magazine of Higher Learning*, *44*(3), 40–47. https://doi.org/10.1080/00091383.2012.672915

Ryan, R., Connell, J. P., & Deci, E. (1985). A motivational analysis of self-determination and self-regulation in education. *Research on Motivation in Education: The Classroom Milieu*, *2*, 13–51.

Ryan, R., & Deci, E. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Ryan, R., & Deci, E. (2000b). When rewards compete with nature: The undermining of intrinsic motivation and self-regulation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation* (pp. 13–54). Academic Press. https://doi.org/10.1016/B978-012619070-0/50024-6

Ryan, R., & Deci, E. (2017). *Self-Determination theory: Basic psychological needs in motivation, development, and wellness*. The Guilford Press.

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). SAGE.

Sandholtz, J. H., Ringstaff, C., & Dwyer, D. C. (1997). *Teaching with technology: Creating student-centered classrooms* (1st Paper edition). Teachers College Press.

Sanford, N. (1976). *Faculty motivation: Working papers and review of the literature* (p. 145). The California State University, Center for Professional Development.

Santos, G. G. (2016). Career barriers influencing career success: A focus on academics' perceptions and experiences. *Career Development International*, *21*(1), 60–84. https://doi.org/10.1108/CDI-03-2015-0035

Scott, P., & Mouza, C. (2007). The Impact of Professional Development on Teacher Learning, Practice and Leadership Skills: A Study on the Integration of

Technology in the Teaching of Writing. *Journal of Educational Computing Research*, *37*(3), 229–266. https://doi.org/10.2190/EC.37.3.b

Seaberg, J. R. (1998). Faculty Reports of Workload: Results of a National Survey. *Journal of Social Work Education*, *34*(1), 7–19. https://doi.org/10.1080/10437797.1998.10778901

Seipel, M. T., & Larson, L. M. (2018). Supporting non-tenure-track faculty well-being. *Journal of Career Assessment*, *26*(1), 154–171. https://doi.org/10.1177/1069072716680046

Selwyn, N. (2016). *Is technology good for education?* (1st ed.). Polity.

Shabila, N. P., Ahmed, H. M., & Yasin, M. Y. (2014). Women's views and experiences of antenatal care in Iraq: A Q methodology study. *BMC Pregnancy and Childbirth*, *14*, 43. https://doi.org/10.1186/1471-2393-14-43

Shapley, K., Sheehan, D., Maloney, C., & Caranikas-Walker, F. (2011). Effects of Technology Immersion on Middle School Students' Learning Opportunities and Achievement. *The Journal of Educational Research*, *104*(5), 299–315. https://doi.org/10.1080/00220671003767615

Shemmings, D. (2006). "Quantifying" qualitative data: An illustrative example of the use of Q methodology in psychosocial research. *Qualitative Research in Psychology*, *3*(2), 147–165. https://doi.org/10.1191/1478088706qp060oa

Shemmings, D., & Ellingsen, I. T. (2012). Using Q methodology in qualitative interviews. In J. Gubrium, J. Holstein, A. Marvasti, & K. McKinney, *The SAGE Handbook of Interview Research: The Complexity of the Craft* (pp. 415–426). SAGE Publications, Inc. https://doi.org/10.4135/9781452218403.n29

Sims, R. L., & Penny, G. R. (2014). Examination of a failed professional leaning community. *Journal of Education and Training Studies*, *3*(1), 39–45. https://doi.org/10.11114/jets.v3i1.558

Skewes, M. C., Shanahan, E. A., Smith, J. L., Honea, J. C., Belou, R., Rushing, S., Intemann, K., & Handley, I. M. (2017). Absent autonomy: Relational competence and gendered paths to faculty self-determination in the promotion and tenure process. *Journal of Diversity in Higher Education*, *11*(3), 366–383. https://doi.org/10.1037/dhe0000064

Smith, J. L., Handley, I. M., Rushing, S., Belou, R., Shanahan, E. A., Skewes, M. C., Kambich, L., Honea, J., & Intemann, K. (2017). Added benefits: How supporting women faculty in STEM improves everyone's job satisfaction. *Journal of Diversity in Higher Education*, *11*(4), 502–517. https://doi.org/10.1037/dhe0000066

Sneegas, G. (2020). Making the case for critical Q methodology. *The Professional Geographer*, *72*(1), 78–87. https://doi.org/10.1080/00330124.2019.1598271

Sorcinelli, M. D., Austin, A. E., Eddy, P., & Beach, A. (2006). *Creating the future of faculty development: Learning from the past, understanding the present*. Anker Publishing.

Spector, J. M. (2005). Time demands in online instruction. *Distance Education*, *26*(1), 5–27. https://doi.org/10.1080/01587910500081251

Staat, W. (1993). On abduction, deduction, induction and the categories. *Transactions of the Charles S. Peirce Society*, *XXIX*(2), 225–237.

Stenner, P. (2011). Q Methodology as qualiquantology: Comment on ‘“Q methodology and its position in the mixed methods continuum.”‘ *Operant Subjectivity*, *34*(3), 192–203.

Stenner, P., Cross, V., McCrum, C., McGowan, J., Defever, E., Lloyd, P., Poole, R., & Moore, A. P. (2015). Self-management of chronic low back pain: Four viewpoints from patients and healthcare providers. *Health Psychology Open*, *2*(2), 2055102915615337. https://doi.org/10.1177/2055102915615337

Stenner, P., & Stainton-Rogers, R. (2004). Q methodology and qualiquantology: The example of discriminating between emotions. *Mixing Methods in Psychology*, 101–120.

Stephenson, W. (1953). *The study of behavior: Q-technique and its methodology*. The University of Chicago Press.

Stephenson, W. (1983). Against interpretation. *Operant Subjectivity*, *6*(3), 73–103.

Stokowski, S., Li, B., Goss, B. D., Hutchens, S., & Turk, M. (2018). Work motivation and job satisfaction of sport management faculty members. *Sport Management Education Journal*, *12*(2), 80–89. https://doi.org/10.1123/smej.2017-0011

Stover, S., & Veres, M. (2013). TPACK in higher education: Using the TPACK framework for professional development. *Global Education Journal*, *2013*(1), 93–110.

Stupnisky, R. H., BrckaLorenz, A., Yuhas, B., & Guay, F. (2018). Faculty members’ motivation for teaching and best practices: Testing a model based on self-determination theory across institution types. *Contemporary Educational Psychology*, *53*, 15–26. https://doi.org/10.1016/j.cedpsych.2018.01.004

Stupnisky, R. H., Hall, N. C., Daniels, L. M., & 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*, *88*(3), 376–400. https://doi.org/10.1080/00221546.2016.1272317

Tabata, L. N., & Johnsrud, L. K. (2008). The Impact of Faculty Attitudes Toward Technology, Distance Education, and Innovation. *Research in Higher Education*, *49*(7), 625–646. https://doi.org/10.1007/s11162-008-9094-7

Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What Forty Years of Research Says About the Impact of Technology on Learning: A Second-Order Meta-Analysis and Validation Study. *Review of Educational Research*, *81*(1), 4–28. https://doi.org/10.3102/0034654310393361

Tarr, T. A. (2010). Working with adjunct faculty members. In K. J. Gillespie & D. L. Robertson (Eds.), *A guide to faculty development* (2nd ed., Vol. 1–21, pp. 347–362). Jossey-Bass.

Taylor, A., & McQuiggan, C. (2008). Faculty development programming: If we build it, will they come? *EDUCAUSE Quarterly*, *31*(3), 28–37.

Thomas, D. R. (2006). A general inductive approach for qualitative data analysis. *American Journal of Evaluation*, *27*(2), 237–246. https://doi.org/10.1177%2F1098214005283748

Tight, M. (2018). Tracking the scholarship of teaching and learning. *Policy Reviews in Higher Education*, *2*(1), 61–78. https://doi.org/10.1080/23322969.2017.1390690

Tomei, L. (2006). The impact of online teaching on faculty load: Computing the ideal class size for online courses. *Journal of Technology and Teacher Education*, *14*(3), 531–541.

Tomei, L. A., Bernauer, J. A., & Moretti, A. (2016). *Developing a center for teaching excellence: A higher education case study using the integrated readiness matrix*. Rowman & Littlefield Publishers.

Toni, N., Maphosa, C., & Wadesango, N. (2014). Promoting the interplay between teaching and research in the university and the role of the academic developer. *Mediterranean Journal of Social Sciences*. https://doi.org/10.5901/mjss.2014.v5n11p19

Trochim, W., Donnelly, J., & Arora, K. (2016). *Research methods: The essential knowledge base* (2nd ed.). CENGAGE Learning.

Tuitt, F. (2010). Working with underrepresented faculty. In K. J. Gillespie & D. L. Robertson (Eds.), *A guide to faculty development* (2nd ed.). Jossey-Bass.

U.S. Department of Education. (n.d.). *Use of technology in teaching and learning*. U.S. Department of Education. Retrieved April 25, 2021, from https://www.ed.gov/oii-news/use-technology-teaching-and-learning

U.S. Department of Education & Office of Educational Technology. (2017). *Reimagining the role of technology in higher education: A supplement to the national education technology plan*. Office of Educational Technology. https://tech.ed.gov/files/2017/01/Higher-Ed-NETP.pdf

Valenta, A., & Wigger, U. (1997). Q-methodology: Definition and application in health care informatics. *Journal of the American Medical Informatics Association*, *4*(6), 501–510. https://doi.org/10.1136/jamia.1997.0040501

Velez, E. (2015). Administration and faculty: How relationships create and solve the problems. *Journal of Applied Learning Technology*, *5*(4), 5.

Walton, D. (2001). Abductive, presumptive and plausible arguments. *Informal Logic*, *21*(2). https://doi.org/10.22329/il.v21i2.2241

Warburton, E. C., Chen, X., & Bradburn, E. M. (2002). *Teaching with technology: Use of telecommunications technology by postsecondary instructional faculty and staff in Fall 1998.*

Ward, H. C., & Selvester, P. M. (2012). Faculty learning communities: Improving teaching in higher education. *Educational Studies*, *38*(1), 111–121. https://doi.org/10.1080/03055698.2011.567029

Ward, K. (Kelly A., & Wolf-Wendel, L. (2004). Academic Motherhood: Managing Complex Roles in Research Universities. *The Review of Higher Education*, *27*(2), 233–257. https://doi.org/10.1353/rhe.2003.0079

Watts, S., & Stenner, P. (2012). *Doing Q methodological research: Theory, method and interpretation*. SAGE.

Watty, K., McKay, J., & Ngo, L. (2016). Innovators or inhibitors? Accounting faculty resistance to new educational technologies in higher education. *Journal of Accounting Education*, *36,* 1–15. https://doi.org/10.1016/j.jaccedu.2016.03.003

Whitelaw, C., Sears, M., & Campbell, K. (2004). Transformative Learning in a faculty Professional development Context. *Journal of Transformative Education*, *2*(1), 9–27. https://doi.org/10.1177/1541344603259314

Williams, G. C., McGregor, H. A., Sharp, D., Levesque, C., Kouides, R. W., Ryan, R. M., & Deci, E. L. (2006). Testing a self-determination theory intervention for motivating tobacco cessation: Supporting autonomy and competence in a clinical trial. *Health Psychology*, *25*(1), 91–101. https://doi.org/10.1037/0278-6133.25.1.91

Winter, E., Costello, A., O'Brien, M., & Hickey, G. (2021). Teachers' use of technology and the impact of Covid-19. *Irish Educational Studies*, *0*(0), 1–12. https://doi.org/10.1080/03323315.2021.1916559

Wolf, A. (2014). The interview in Q methodology: Readiness to adopt sustainable responses to climate change. In *SAGE research methods cases*. SAGE Publications, Ltd. https://doi.org/10.4135/978144627305014539121

Wolfe, S. E., Greenhill, B., Butchard, S., & Day, J. (2020). The meaning of autonomy when living with dementia: A Q-method investigation. *Dementia*, 1471301220973067. https://doi.org/10.1177/1471301220973067

Yildirim, I. (2017). Students' perceptions about gamification of education: A Q-Method analysis. *Education and Science*, *42*(191), 235–246. https://doi.org/10.15390/EB.2017.6970

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (REL 2007–No. 033; Issues & Answers Report). U.S. Department of

Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. http://ies.ed.gov/ncee/edlabs

Zaharie, M. A., & Seeber, M. (2018). Are non-monetary rewards effective in attracting peer reviewers? A natural experiment. *Scientometrics, 117*(3), 1587–1609. https://doi.org/10.1007/s11192-018-2912-6

Zhu, C., & Engels, N. (2014). Organizational culture and instructional innovations in higher education: Perceptions and reactions of teachers and students. *Educational Management Administration & Leadership*, *42*(1), 136–158. https://doi.org/10.1177/1741143213499253

Zhu, N., Xu, P., Ma, J., Liang, Y., Xu, X., & Li, J. (2019). Patients, caregivers and nurses' attitudes toward patients' participation in knee and hip joint replacement pain management: A Q-methodology study. *Contemporary Nurse, 55*(6), 507–521. https://doi.org/10.1080/10376178.2019.1666019

Zobeidi, T., Yazdanpanah, M., Fourozani, M., & Khosravipour, B. (2016). Typology of Wheat and Vegetable Farmers' Perception Towards Climate Change Through of Q-Methodology. *Journal of Rural Research, 7*, 374–391. https://doi.org/10.21859/jjr-07028

APPENDIX A. Guiding Questions for Interviews in the Exploratory Study

Guiding questions for the interview with group one faculty

1. How did you hear of ITT Academy for the first time? Did you attend it right after that? Why? Why not?
2. How did you decide to participate in ITT Academy?
3. I noticed that you've been in three of ITT Academies, what made you decide to come back/ participate multiple times?
4. Do you consider yourself as digital literate? Why? Why not?
5. Tell me what it's like when you are going to an ITT Academy? Tell me about your overall experience with ITT Faculty Academy? What's good What's bad?
6. What is one of the helpful things that you learned from ITT Academy?
7. If you were describing ITT Academy to a colleague who might be interesting in being one, how would you describe it?
8. We'd like to reach out to more faculty; how do you think we could encourage more faculty to participate?
9. Do you have any suggestions about how to make ITT Academy better for attendants? Anything you hope to change?
10. Every full-time faculty who finished ITT Academy will receive a $500 stipend, how important was that stipend to you in deciding to participate in an ITT Faculty Academy?

Guiding questions for the interview with group two faculty

1. Do you mind telling me how your instruction time is budgeted?
2. Can you talk about the activities that consume most of your time?
3. How important is teaching relate to your career goal?
4. How do you think the university values teaching?
    a. How does university reward faculty regarding teaching?
5. Are you aware of any faculty development workshops provided by COE or the university?
    a. If yes, what're they? Have you attended any of them? What're your overall experiences with them?
    b. Do you think those workshops are needed/ helpful?
6. Introduce ITT. Based on the introduction, what do you think of the structure of ITT Faculty Academy?
    a. What do you think of the time commitment for ITT workshops?
7. If you decided to attend one of the Faculty Academies, what content or knowledge would you expect to learn?
8. What prevented you from participating in ITT workshops?

APPENDIX B. Codebooks for Exploratory Study

Codebook for Group One Interviews		
Code Groups	**Code**	**Grounded**
Atmosphere	comfortable	10
	diversity in population	4
Awareness	email announcement	9
	peer recommendation	10
Belief	tech: confidence	7
	tech: external pressure	8
	tech: interact with students	1
	university value: teaching	3
	enjoy learning	4
	personal interest	11
	tech: improve teaching	3
	tech: improves work efficiency	4
	TPD: effectiveness	5
Content	FPD content	7
	structured learning	7
Emotion	overwhelmed	4
Format	convenience	3
	food	4
	individualized learning	12
	on-site support	4
	variety	10
Outcomes	belief changes	3
	failed to implement	4
	foundation	4
	new technologies	12
	pedagogical reflection	7
	resources	8
	teaching improvement	11
	time well-spent	3
Peer	camaraderie	15
	peers' non-engagement	2
	serious attitude	5
	trust	8
	professional network	11
Stipend	not the main motivator	8
	show appreciation	3

	stipend as an additional incentive	14
	stipend helps integration	3
	travel supplement	7
	worries that stipend would be taken away	4
Expectations	reduce the number of apps	2
	solve practical problems	19
	content preview	5
	continuous learning	8
	in-session working time	9
	listen to faculty's needs	9
	recognition from college/university	9
	innovative ideas	5
Time	commitment	20
	workload	4

Codebook for Group Two Interviews		
Code Group	**Code**	**Grounded**
Belief	diversified scholarship	4
	equality between tenure-line and other faculty	5
	low demand	3
	PD effectiveness	5
	subjectivity in the tenure/promotion process	5
	technological competence	3
	PD value	17
	teaching competence	9
	technology	1
Time	commitment	21
	commute and travel	5
	other tasks	17
	research	21
	teaching	2
	grading	1
	workload	12
University Value	research	3
	teaching: recognition -neg	5
	teaching-neg	18
	teaching-pos	6
	teaching: grad students	1
Faculty Needs	content	14

	expectation	12
	faculty needs	2
	format	18
	relationship	1
	stipend	3
	awareness	10

APPENDIX C. Themes Generated from the Exploratory Study

Motivator One: Faculty have a growth mindset. The term *growth mindset* is coined by (Dweck, 2006), which refers to individuals who view intelligence "can cultivate through your efforts, your strategies, and help from other" (p. 7). This term is used to compare with a fixed mindset, which refers to individuals who believe their qualities are inherent and cannot be improved via learning. Faculty in the first group all presented characteristics of a growth mindset regarding their perceptions of TPD. Following are the quotes from interview transcripts:

> *I really enjoy learning. There's always things that I learned I feel very challenged, and it's interesting. I think we learned from each other as well as from the [TPD name] itself.*
>
> *I thought it was a great opportunity to learn from people who knew more than I did about that to improve my practice. Every time I always learned something that I have found to be valuable. I really like to learn.*
>
> *I just like anything that's gonna help me continue to grow with my own teaching practice and or research skills.*
>
> *I love new stuff. But, some of them I can teach myself, and some I need some help with.*

Moreover, faculty not only has a desire to learn but they also are aware of their weakness in integrating technology into their teaching practices, and they agree that attending TPD could help them to improve their practices. It has been well-documented in the literature that teachers' self-confidence or self-efficacy on technology use would influence their technology adoption in practices (Inan & Lowther, 2010; Kopcha, 2010; Lewis et al., 2013). Faculty with higher self-efficacy on technology are more likely to adopt technology into their teaching practices. However, the interview data showed that faculty who perceive themselves with low technological competence could also be

motivated to engage in technology integration if they have a growth mindset. Some faculty admitted that they consider technology as a weakness in their teaching, which was the main reason for their initial participation in TPD.

> *I believe the first one I participated in was on using technology in the classroom and so that was just something that I didn't feel was a strength of mine and so it was something that I wanted to get better at, it was an area of weakness for me and I saw the advertisement I was like oh awesome this is perfect this is exactly something I really need to work on.*
>
> *I needed to get up to speed, I needed to get more involved in tech, I just need more to learn.*
>
> *I was really excited about the opportunity to have someone teach me something that I knew I needed to get better at.*
>
> *Anything that can help me grow in my teaching with technology especially cause I'm so not up to speed on integrating technology and I think it's super important.*

Motivator Two: Positive experiences with TPD. Faculty in group one expressed a highly positive experience with TPD and firmly believed that TPD fulfilled their goal of teaching improvement. They consider TPD as an effective learning approach to explore innovative ideas, tools, and projects. Faculty commented that TPD provided structured learning and foundation for their understanding of teaching with technology as well as pedagogical reflections on their teaching practices.

> *This course is really helpful in terms of thinking about how you can use technology in ways that enrich your pedagogy.*
>
> *[Without participation,] I would have no basis or foundation or schema to have any grounds for understanding the place of technology in the classroom.*
>
> *I've always come away learning something.*
>
> *All my time during the day get eaten up with other tasks, and [if I didn't participate,] I don't have time to just kind of sits, and really focus on this aspect of my practice that I'm very concerned about.*

If I don't take the time during the [TPD] to think about this and talk with other people, there is never any other time during the semester or the year for that's going to happen.

I have implemented things, I felt more connected, I feel like I'm more confident.

Faculty also expressed their satisfaction with the comfortable and relaxed atmosphere in TPD, which made them feel safe to ask questions without being judged. The fact that TPD involves faculty with different levels of technological competence increased the sense of relaxation for faculty participants. Without the expectations of being an expert, faculty enjoyed the low-stress environment in TPD.

It's a safe space meaning it's kind of like you're free to experiment you're free to not know and that it's ok like you don't have to come knowing everything you could have limited experience and that's okay.

I would describe [TPD] as a low-pressure mostly laid-back way to participating in conversations about technology in supporting teaching and to learn about new and different tools that you might not have even known existed.

I think one thing I really like is it's a very accepting environment. It's okay if you don't know. I feel comfortable saying I don't know what you're talking about. I think there are always people there who know more than I do and who know less than I do. I think it's a very welcoming environment to learn too.

I've never felt intimidated in the [TPD name].

Motivator Three: Positive Interpersonal Relationship Established in TPD.

Faculty in group one identified peer-recommendation as the most effective form to convince faculty participation in TPD. Many of them acknowledged that their initial participation was the result of word of mouth. A strong motivator to maintain faculty participation is because of the professional network they established with peers and leaders in TPD.

I enjoyed the camaraderie of getting to know people who weren't in my department.

To be in a room with a bunch of other faculty that are thinking that same way is always exciting.

I enjoyed meeting other colleagues from around the college.

I've always grateful after I've gone because … heard my colleagues you know talking about something that's exactly as the same thing I've experienced and have been frustrated.

There are other people there that they are interested in the same thing so it's a lot of good conversations that's a neat thing.

It's also a really pleasant group of people uh it's nice to just step out and be able to sit down and talk with people about a common interest. I've made sort of professional friends through the [TPD name] that I wouldn't have met otherwise. It's just a really good learning experience and it's a nice social experience too.

Motivator Four: TPD Helps Faculty to Solve Problems. Faculty in both groups highlighted the importance of connecting TPD content to their practical teaching struggles. Compared to TPD that generically introduces innovative strategies, technological tools, or teaching approaches, faculty presented strong interests in bringing individual projects or problems that they are working on to TPD. Faculty indicated that the best strategy to recruit faculty to participate in TPD is to *"figure out how you can solve their problem whatever their problem is."* Faculty also demand for more time on individual working during TPD, where they could receive immediate support from experts.

I think the only thing that might've been even more helpful would've been for us to bring in our specific projects and have time spent with folks who could support our ideas in the moment during the time of the workshops.

For [TPD name], you're not bringing them a problem you're not saying oh you should be using more tech although there's probably an echo of that floating around from just everywhere but what you need to do is figure out why would somebody come here what problem can we solve.

> *I think to reach past the people who are just interested whom you're already getting, somehow you need to be solving a problem they have, and I don't know what it is, and I mean that's the only reason.*
>
> *I know that [TPD leader name]'s very umm hands-on and practical with her technology use so I knew that the things that she would be covering would be things that I would be able to use day to day which I appreciated.*
>
> *There are so many things at the university that are really just people sitting around and talking. There are lots of things that come out that say you know be part of this community or that community, and it's really a lot of people sitting around and reading and talking about things, whereas I find [TPD name] to be much more casual and hands-on.*

However, faculty also complained about TPD that focuses on technology ignored the pedagogical aspect of technology integration and ultimately turned into a technological camp. One faculty described a previous TPD experience as *"kind of jumping around from place to place and clicking buttons and not knowing why you click them."* Many faculty members suggested providing a content preview or open house for long-term TPD to help them make decisions about participating or not. One faculty commented that most faculty *"either don't know what's happening or they looked at [advertisement] and they're not sure what it is."* Another suggested, "*I'll actually like to see before I even go in is basically an outline of what is going to be discussed."* Provide opportunities for faculty to have a trial workshop before they committed to the long-term participation will encourage more people to *"get in the door."*

Motivator Five: Stipend as An Additive Incentive. Faculty conveyed mixed feedback regarding financial incentives for TPD participation. Few confessed that due to limited travel budget in the college, $500 stipend was a big motivator and *"[without stipend,] I don't think I would have repeated my attendances in the other [FPD name] even though I thoroughly enjoyed them."* However, most faculty perceived stipend as a

symbolic appreciation for their time, which is an additive motivator for faculty to persist their participation. Faculty agreed that the availability of stipend showed that university or college values TPD.

> *It's more symbolic that we appreciate your time, and we want to compensate your time.*
>
> *I recognized that [the stipend] tells me that [the university] thinks enough of me to invest in it. That motivated me to want to be a part of [the PD], this is something that university is considering as important because they're putting money on the table.*
>
> *It's more than the money, it's not just the money.*
>
> *The fact that there's a little bit of money involved makes me feel like I'm not being taking advantage of.*
>
> *A lot of times money is time, we don't have the money, and we get ideas when we want to do things. Honestly, it's not my prime motivation, but it's nice.*

One faculty shared a story of her friend quitted TPD halfway and pointed out that stipend *"was a way to start, but [her friend] didn't stay."* Faculty value time more than financial awards. If TPD did not meet faculty needs, faculty rarely stay for the stipend because "*most faculty won't care about [stipend] too much."* If TPD provided engaging content and practical solutions for faculty, faculty confirmed that *"I would go if we didn't get paid. I would go if we didn't have lunch, you know, I just enjoyed it."*

Barrier One: Time, Time, and Time. Faculty workload and a busy schedule have been well-documented in the literature as a barrier for their participation in different tasks (see chapter 2). Again, time commitment was identified as the top barrier by faculty in both groups. Every faculty member described their struggles to manage time to balance research, teaching, service, and any other activities. Even faculty who are highly motivated to participate in TPD and enjoyed TPD struggled to commit time for TPD.

> *I'll be honest with you, before the meetings I often think I don't have time to do this. I'm often wondering whether or not I really should go because I am really busy and it is a large chunk of time. But once I get there, I always learned something valuable like it's always a good use of my time. It is kind of a struggle because it is really a big time commitment. There's always two sides to that coin. It's a luxurious three hours to spend thinking about something, but that luxury has a very high cost because I don't usually have three hours in a day to give up to it.*

> *On the one hand it's easy to commit for that time and on the other hand, every time I do it there's always one [session] I can't make because I'm traveling so much umm so that's the barrier … it doesn't take up that much time, it's not like that 12 hour is gonna kill me off doing something else, but I always have trouble with that.*

Faculty in group two mostly ascribed their non-participation to heavy workload and busy schedule. *"I'm very busy"* is the most common reason they provided for not participating in any TPD.

> *Time commitment is a big reason.*

> *It's a lot of time.*

> *A big factor is how much time it would take to attend a workshop. I would need a big payoff.*

> *I think that's a big time commitment for faculty.*

> *I had so many other things to do, that it was just too time-consuming, taken too much of my time.*

> *I think the greatest obstacle is time for me.*

Some faculty explained that time trade-off includes not only time within TPD, but also commute time they travel from home to campus since most faculty work at home nowadays.

> *Because of the nature of people working electronically, and people teaching online, and people doing research, a lot of grants and things, people just aren't around.*

That has to be the greatest workshop ever conducted, for me to say, I'm not gonna write today, I'm gonna go spend half an hour getting to campus, going to a workshop. You know, that's half a day! Especially when you have to travel in there.

A lot of my time now for the past three years is taken up with commuting.

I have issues with parking [on campus].

Barrier Two: Research-driven Culture. A significant theme that emerged from group two faculty was their prioritization of research activities over others. Most of them agreed that university values research activities (e.g., publications, grants) over other activities including teaching. They claimed that a good research profile is the most critical piece in the tenure or promotion process. It is acceptable to have a generic teaching profile for promotion because *"everyone is the same regarding teaching. Everyone is assigned two courses."* Another faculty mentioned that *"teaching is obviously a part of getting tenure but realistically I mean one of the things for teaching is you could get very quickly to get to a point where you're getting good teacher evaluations and then that's an out to get tenure."* Only one faculty questioned that the promotion guideline does not specify that research is valued more than teaching; most faculty agreed that research universities should value research over other activities.

So research I try to make the priority since at a research-intensive university, that's sort of our major job and what we are evaluated for every year.

I've always understood my job at a research university to involve research.

Research takes a lot of my time.

I think that's true everywhere they really only care about your publication and grants.

I think in terms of value, is research, grants, teaching, in that order.

Barrier Three: Lack of recognition for teaching and TPD. Both groups of faculty members indicated that teaching activities and TPD activities were not fully recognized at the university-level and department-level. As discussed earlier, faculty do not consider teaching is important regarding their promotion or tenure process, which indicated low recognition for faculty's teaching achievements.

> *I think [the university] says it values teaching, but I don't think it really values teaching very much. I mean basically the only way we evaluate teaching is the end of the course evaluations by students and that's it. I know a lot of professors who don't really care [teaching]. I mean I've heard stories like professors getting horrible teaching evaluations and still getting tenure, still getting promoted.*

> *Realistically nobody cares at the university how well you teach … at my previous institution, teaching, nobody really cares that much about it… I don't think how I did in teaching had anything to do with getting tenure or not. They really only care, I think that's true everywhere, they really only care about your publication and grants. Grants are very important in that too.*

The fact that TPD is not included in the annual evaluation process also signals a low value of TPD to faculty members. One faculty stated that *"right now I don't even put that on my annual report that I attend [TPD name] workshop"* because *"I don't get the feeling it's valued by the college"*. Faculty considered their TPD participation *"feel like a sacrifice"* because of the huge trade-off, such as *"every article I'm not writing, every student I'm not meeting with, everything I'm not grading. I mean you'll soon see if you stay in an R-I place, it's very stressful and intense."*

One faculty pointed out that the demand for TPD at the college of education is probably low because *"in COE a lot of faculty are good at teaching-related stuff, they know those things well"* and *"not every faculty has this kind of needs."* Another faculty asserted that *"[COE faculty are] better just because a lot of us were teachers before we became professors, so we're already better at teaching, and we already kind of knew what we're doing when it comes to teaching."*

Coherently, faculty in group two perceived the value of TPD as low and do not consider TPD as an effective form of learning. They agreed that *"I'm good at teaching myself"* and did not see the importance of TPD.

> *This is just something called professional development. It belongs to continuing education. To me, personally, I think my schedule is very tight. I feel I'm very busy. Unless it's something I really need to learn or something that I can see immediate effects and see the improvement, [otherwise] it's pretty hard for me to commit [for TPD].*
>
> *They would take time away from my work at this point, it wouldn't help it.*
>
> *There was not that much more for me to learn in terms of what's been offered in those programs.*
>
> *[TPDs] are especially for younger faculty.*
>
> *Workshops are more helpful to those new faculties instead of senior faculty.*

One faculty concluded:

> *I think that often people that go to these are the ones they're already pretty good at it and they're interested in it and they always want to learn more. Sometimes I think the people who need [TPD] the most are never going to come because they're not particularly reflective and they don't care about it.*

Barrier Four: Negative Beliefs on Technology. In contrast to faculty in group one, group two faculty presented mixed thoughts regarding technological uses for educational purposes. Some hold doubts on technology:

> *I think technology is a distraction, often. I think it's much better to use it in a supplementary way.*
>
> *I would say that if I were interested in teaching an online course, I would need a workshop to do it because I've never taken one. I've never been involved in one. I don't know how they work, but I also don't want to teach online courses… My teaching is actually very low-tech because I like just the immediacy of other people you know material things much better than I like the abstraction of this secondary symbolism of things that are on a computer. I like real discussions you know where people are actually talking to each other.*
>
> *I'm actually not an early adopter I don't want to have to figure out how to fix [technological tools] myself.*
>
> *My students probably are more digitally agile than I am, but I'm as agile as I need to be… my job is to construct an environment where there's an ethos of exploration and inquiry and experimentation. For young students, that often does have a technological component, but I don't need to know how to do all these things for them to use the knowledge that they already have to experiment with teaching.*

Some claimed that they have rich experiences with technology that they do not need TPD to facilitate their further learning:

> *I have a lot of experience with technology and teaching online stuff … I have been to so many faculty development workshops that I'm tired.*
> *I've not been able to go or to attend any of [TPD]. I've put on workshops myself for the diversity conference and technology conference.*

APPENDIX D. Quotes Collected from Exploratory Study

Below is a list of direct quotes from the previous interview with 13 faculty members in the exploratory study. All the quotes related to their motives, barriers, and perceptions of participating technology TPD. Quotes are categorized into themes.

Motives	
Autonomous Motivation	
Career Development	I wanted to prepare myself for putting my course online and I wanted some structure on how to do that
	as a program, we wanted to get the same information to think about how to put our courses together
	I need to know about that if I'm gonna work with those teachers and those librarians
	I just like anything that's gonna help me continue to grow with my own teaching practice, umm, and/or research skills.
	and I was going to be teaching online courses
	probably more related to career
	Because it'll just, all my time during the day get eaten up with other tasks, and, I don't have time to just kind of sits, and really focus on this, this aspect of my practice that I'm very concerned about.
	if I don't take the time during the ITT Academy to think about this and talk with other people, there is never any other time during the semester or the year for that's going to happen.
Pedagogical Beliefs	because oftentimes, we take a lot of time doing things that could probably be done a lot faster or more efficiently if we knew the technology
	[using technology in the classroom] was just something that I didn't feel was a strength of mine, and so, something that I wanted to get better at
	I was really excited about the opportunity to have someone teach me something that I knew I needed to get better at
	I'm really, I'm really committed to using technologies
	I needed to get more involved in tech
	Cause I'm too motivated, and interestingly enough
	it's not necessarily complicated, but it's something that I wouldn't have taken the time to figure out on my own
	I love new stuff. But some of them I can teach myself, and some I need some help with.
	it's always a good use of my time

	all my time during the day get eaten up with other tasks, and, I don't have time to just kind of sits, and really focus on this aspect of my practice that I'm very concerned about.
	if I don't take the time during the [PD] to think about this and talk with other people, there is never any other time during the semester or the year for that's going to happen.
Beliefs on PD	I've always come away learning something
	I would have no basis or foundation or schema to have any grounds for understanding the place of technology in the classroom
	this course is really helpful in terms of thinking about how you can use technology in ways that enrich your pedagogy
	I have implemented things, I felt more connected, I feel like I'm more confident
Relationship	
	I enjoyed the camaraderie of getting to know people who weren't in my department
Professional Network	I mean I always learn a few more things that I can do, but always just to be in a room and talk with people about those kinds of things gets you thinking again and gets you moving
	but I get in this room of people, and it's not just the instructor, I get in this room with other people who have suggestions
	They seem to really have good background, information.
	super laid-back approach [of the PD leader]
PD Leaders	[the PD leader] does a great job of listening to what we asked for
	super applicable, very individualized, umm, I mean I've never felt intimidated in the academy
	But in both cases, [the PD leaders] made everybody every comfortable
External Motivation	
	it's more symbolic that we appreciate your time, and we want to compensate your time
	I recognized that, [the stipend] tells me that [the university] thinks enough of me to invest in it. That motivated me to want to be a part of [the PD], this is something that university is considering as important because they're putting money on the table.
Financial Incentives	it's more than the money, it's not just the money
	it was a way to start, but [the participant] didn't stay.
	I also think the $500 stipend was a big factor. Because the travel money is hard to come by in the college.
	this was a nice way to supplement the travel budget
	I believe the financial incentive from the dean's office is a major factor in people's thinking about whether to participate or not.
	The money definitely is a great idea

	increasing the amount of the compensation for participation would probably yield a greater number
	The fact that there's a little bit of money involved makes me feel like I'm not being taking advantage of
	a lot of times money is time, we don't have the money, and we get ideas when we want to do things. Honestly, it's not my prime motivation, but it's nice
	in terms of stipend, probably most faculty won't care about this too much
	I would go if we didn't get paid. I would go if we didn't have lunch, you know, I just enjoyed it.
	it's important to let faculty know that their time is valued
Recognition	I think that another thing might make it more faculty is that if there were any kind of recognition
	Because our time is very valuable, and it's not valued ever anywhere
	it's important to let faculty know that their time is valued
	faculty could apply for one semester to get course release, the reduction in teaching, to work on some sort of project with the staff at [PD]
Food	food is a great way to get people to come
	it wouldn't change my decision to participate, but the fact that they do feed us lunch makes me a happier participant
Internalization	
Research-driven	on the university's perspective, of course they value teaching too, but compare to research, I think, in some degree, they value research a little bit more
	Because [evaluation on] teaching is all the same, everyone is assigned two classes. Eventually they need to evaluate your research.
	research takes a lot of time
	so, research I try to make the priority since at a research-intensive university, that's sort of our major job and what we are evaluated for every year
	I think that's true everywhere they really only care about your publication and grants
	I think in terms of value, is research, grants, teaching, in that order
	I've always understood my job at a research university to involve research
	my teaching has often been very carefully tied to my [research].
Value Teaching	there's an infrastructure to support teaching so I think that shows that they value it
	There are a lot of teaching awards
	they have a lot of awards at the college

	there's an infrastructure to support teaching so I think that shows that they value it
Barriers	
Time Commitment	it was hard to find that time on my own to focus on that and without pressure to do it, I just haven't had chance to do it
	I'm very busy
	time commitment is a big reason
	it's a lot of time
	a big factor is how much time it would take to attend a workshop. I would need a big payoff
	I think that's a big time commitment for faculty
	I had so many other things to do, that it was just too time consuming, too much, taken too much of my time.
	I think the greatest obstacle is time for me.
Time of the PD	the timing is not always great
	I would come face-to-face in the summer because I have the time to do it.
Workload	You're probably hearing a lot of faculty say that they're just overwhelmed with their work, and I think a lot of us have just taken on too much
	the only reason I don't attend or haven't attended them is because of the workload that I'm under
	But for me is very difficult to do all three [research, teaching, and service] well and especially if it's been a long time focusing on trying to teach well
Commute	I'm travelling so much
	because of the nature of people working electronically, and people teaching online, and people doing research, a lot of grants and things, people just aren't around
	That has to be the greatest workshop ever conducted, for me to say, I'm not gonna write today, I'm gonna go spend half an hour getting to campus, going to a workshop. You know, that's half a day! Especially when you have to travel in there.
	a lot of my time now for the past three years is taken up with commuting
	I have issues with parking
Format of the PD	it was hard to find that time on my own to focus on that and without pressure to do it, I just, haven't had a chance to do it
	I like doing things that are online, that I can participate in.
	but they didn't have enough people in the room to work with individuals who were having difficulties
	I think having time during that [PD] to actually work on it as supposed where to be homework and then keep coming back, I think, that would be more helpful for me.

	having that time in the [PD] to work on your project, I think, would be invaluable
	the only thing that might've been even more helpful would have been for us to bring in our specific projects and have time spent with folks who could support our ideas in the moment during the time of the workshops
	there might be a sweet spot somewhere in between, where you could actually work on problems and explore questions that are immediate to you, because of what you're doing in the classroom.
	it's kind of this nice balance between getting information and, being able to work on something on my own
	It would be almost interesting to try out a more concentrated [PD]
	because you need to have some time, to try things out, if it would be really short, I think that will be frustrated
	we don't have enough time to do application in space and time they provided
	I might be interested in, for example, they have some case studies
	or something that a lot of people have used, and is effective, some technological tools, or pedagogical concepts, are all good.
	whenever I'm providing training, I need to be prepared for people who are different
Content of the PD	it would have to be something you know, just a totally new idea to me at this point
	I think they either don't know what's happening or they looked at it and they're not sure what it is
	I don't know if I'll be able to use it in practice
	I'm busy and so you know do I spend my time in that in that and I'm not sure what I'll get out of it
	I would have probably first started out talking about what is the thing.
	It was kind of jumping around from place to place and clicking buttons and not knowing why you click them.
	I'll actually like to see before I even go in is basically an outline of what is going to be discussed
	it depends on the intersection of faculty and workshop
Pedagogical Beliefs	learning curve on technology is a giant pain
	I know what I'm doing
	my teaching is actually very low-tech
	I think technology is a distraction, often. Umm, I think it's much better use it supplemental, supplementary way
	I have a lot of experience with technology and teaching online stuff
	I'm actually not an early adopter I don't want to have to figure out how to fix it myself

Beliefs on PD	it's not because I wasn't interested, it was just that I couldn't do anything extra
	because not every faculty has this kind of needs
	because I feel like in COE, a lot of faculty are good at teaching, and related stuff. They know [teaching] well
	I am 64 years old; I don't really need to go to workshop anymore
	they would take time away from my work at this point, it wouldn't help it
	there was not that much more for me to learn in terms of what's been offered in those programs
	I have been to so many faculty development workshops that I'm tired
	the other reason people attend things, or do things is because they need to solve a problem
	There aren't as many opportunities [for senior faculty] as it, as it there for young professors
	It belongs to continuing education
	unless it's something I really need to know, or something that I can see immediate effects, [I can] see the improvement quickly, then I might spend three hours on it, I'll be willing to do it.
	they are especially for younger faculty
	workshops are more helpful to those new faculties in set for senior faculty
	I think that often people that go to these are the ones they're already pretty good at it and they're interested in it and they always want to learn more sometimes I think the people who needs is the most are never going to come because they're not particularly reflective and they don't care about it

APPENDIX E. Survey in Lowenthal et al., (2012) Study

1. How many times in the past two years have you attended a college/university sponsored development opportunity?

2. How many times in the past two years have you attended professional organization sponsored development opportunity?

3. What opportunities and rewards would you like to receive for your participation in professional development activities? *[Choose all that apply.]*
    a. Stipend
    b. Release time
    c. Promotion
    d. Public recognition
    e. Awards for teaching excellence
    f. Letter from Chancellor or Dean
    g. Certificates of completion
    h. Rewards are not important
    i. Other_____

4. In addition to the incentives listed in the question above, what particular factors would motivate you and your colleagues to attend a faculty development workshop?

5. Think back to a time when you attended a faculty development activity. Why did you attend?
    a. It was required
    b. Needed to participate for promotion
    c. A stipend was offered
    d. It was in conjunction with a professional conference
    e. It was related to teaching
    f. It was related to research
    g. It was related to technology
    h. Other

6. What are the most serious obstacles to your participation in faculty development activities sponsored by the university?
    a. Time and/or date
    b. Competing priorities
    c. Topic not interesting or relevant
    d. Lack of institutional or departmental support
    e. Other

7. What faculty development resources has the university provided you in the past three years (e.g., stipends, course release, etc.)

8. Imagine you had access to a budget of $100,000 for faculty development. Besides allocating funds to faculty via grants, how would you spend the money?

9. Please rank order these with 1 being the first choice, 2 your second choice, etc.

   1 2 3 4 5 6 7

   a. New classroom technology
   b. Books or video tapes
   c. Weekend retreat
   d. One-hour workshop
   e. Online workshop (self-paced)
   f. Online workshop (facilitated)
   g. Other (please elaborate)

10. Please describe your biggest teaching challenge

11. What are the challenges you face in integrating new ideas from faculty development activities into your teaching? *[Choose all those that apply.]*
    a. Time to reflect and plan
    b. Time to prepare new materials
    c. No room in my syllabus
    d. Need for resources
    e. Organizational climate
    f. Possible student resistance
    g. No follow-up support from experts
    h. Other_____

12. How could faculty development activities help you keep up with the changing technology of your discipline?

13. What faculty development resources has the university provided in the past three years (e.g., faculty attending conferences, purchase of books and videos, workshops, etc.)?

14. Which type of appointment best describes your position?
    a. Full-time benefited faculty
    b. Affiliate faculty
    c. Other_____

15. What is your academic rank?
    a. Affiliate faculty
    b. Assistant Professor
    c. Associate Professor
    d. Professor
    e. Other_____

16. How many years have you been in higher education?

17. On an average, how many credit hours do you teach each semester (i.e., for Fall, Spring, and Summer)?

18. What format do you primarily teach?
    a. Classroom based
    b. Online
    c. Guided Independent Study
    d. Other, please specify

APPENDIX F. Pre-sorting Survey for the Q Study

Determination of eligibility

1. Are you a full-time College of Education faculty?
    a. Yes.
    b. No.
2. Have you worked at UGA for three or more years?
    a. Yes.
    b. No.
3. Is teaching a significant component of your budgeted time?
    a. Yes.
    b. No.
4. How many courses do you teach in an academic year?
    a. 1
    b. 2
    c. 3
    d. 4
    e. 4+

Note: If any of the answers for question 1 to 3 were no, the participants will be directed to the end of the survey and informed that they are not the targeted population.

Demographic Questions

5. Which department are you in?
    a. Career and Information Studies
    b. Communication Sciences and Special Education
    c. Counseling and Human Development Services
    d. Educational Psychology
    e. Educational Theory and Practice
    f. Kinesiology
    g. Language and Literacy Education
    h. Lifelong Education, Administration, and Policy
    i. Mathematics and Science Education
    j. Other (please state)
6. What is your current rank?
    a. Professor (tenure-track)
    b. Associate Professor (tenure-track)
    c. Assistant Professor (tenure-track)
    d. Clinical Professor
    e. Clinical Associate Professor
    f. Clinical Assistant Professor

   g. Lecturer
   h. Instructor
   i. Other (please state)
7. What is your current gender identity?
   a. Male
   b. Female
   c. Transgender
   d. Genderqueer/Gender non-conforming
   e. Different Identity (please state): _____
8. What is your self-identified ethnicity? (checkbox)
   a. Asian
   b. Black/African
   c. Caucasian
   d. Hispanic/Latinx
   e. Native American
   f. Pacific Islander
   g. Different Identity (please state): _____

Professional Development

9. When was your last time to attend a teaching professional development?
   a. Never
   b. More than three years ago
   c. More than a year ago
   d. Within a year
   e. Within six months
   f. Within a month
10. How would you rate the effectiveness of teaching professional development you have attended?

	Not effective at all	Somewhat ineffective	Neutral	Somewhat effective	Very effective
Improving my teaching efficacy					
Improving my students' academic performance					
Building my professional network					

11. In your opinion, which COE faculty benefit the most from participating in teaching professional development events?

a. All COE faculty members can benefit from teaching professional development
b. Only certain COE faculty. Please specify.
c. Few COE faculty can benefit from teaching professional development.

12. In 15 words or less, how would you define teaching professional development?

Phase Two Participation

13. Thanks for your participation in the first phase of the study. We invite you to continue participating in the second phase of the study. The second phase of the study involves a web-based sorting activity. You will be asked to complete a web-based sorting activity called Q-sort. Q-sort is the core of a unique mixed methods research methodology named Q methodology. The Q-sort consists of dozens of statements regarding perceptions of teaching professional development. You will be asked to sort all statements from most agree to least agree. You will be asked to briefly explain your rationale behind the sorting after the sorting activity. The total time for the second phase will be around 30 minutes. This participation is voluntary. If you are interested in participating, please leave your contact information in the next page. The researcher will contact you soon.
    a. Yes, I'll willing to participate in the second phase.
    b. No, I'm done.

Note: If participants indicated to continue their participation, they will be directed to question 14.

14. My email is _____.

APPENDIX G. Instruction for Web-based Q-sorts

A web-based software, Easy HTMLQ, was used to collect Q-sorts from participants. Following are step-by-step instruction to guide participants complete the online Q-sort.

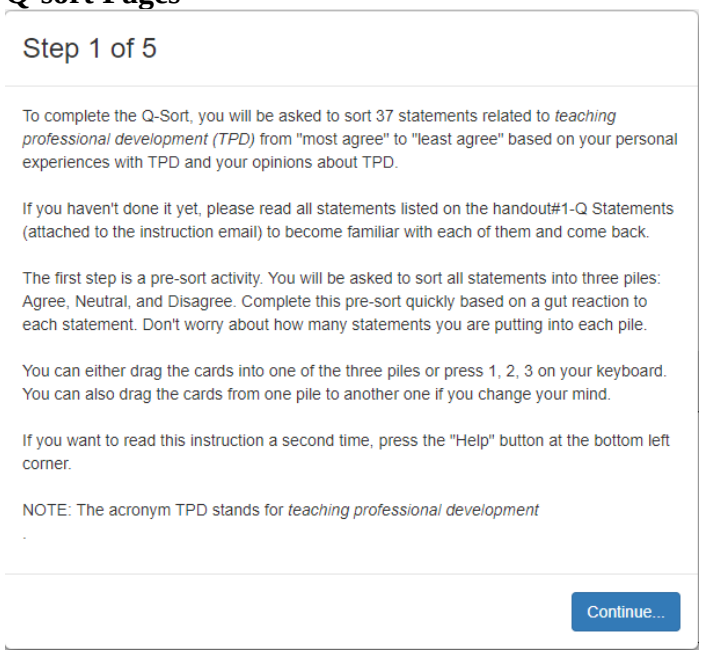
Welcome Page
Thank you for your participation in Si Zhang's study. Please email her at zhangsiz@uga.edu if you encounter any problems while sorting. Click on the continue button to advance.

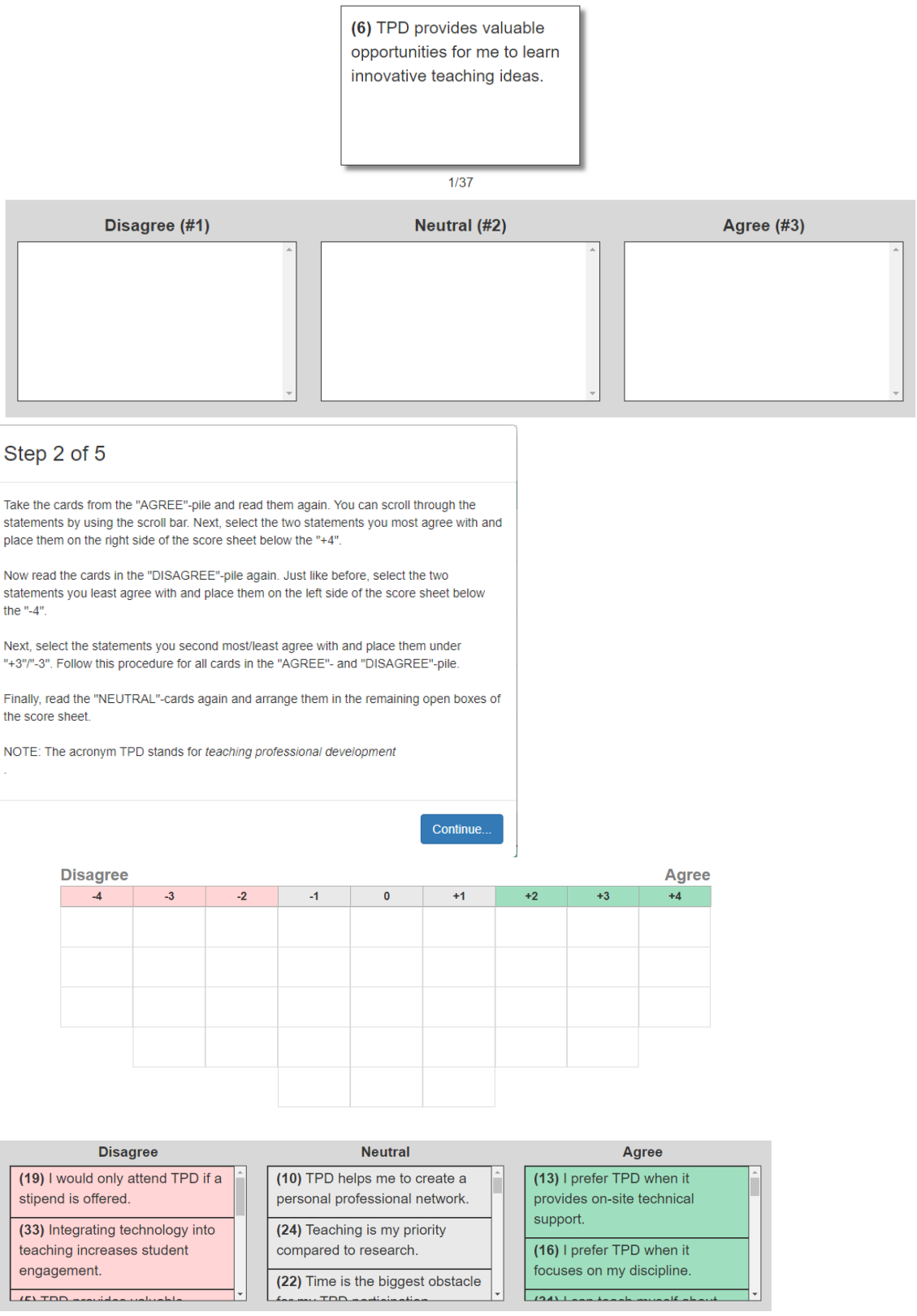
Consent Form Page
A consent from is attached to the instruction email. Please obtain a copy of the consent form for your record.

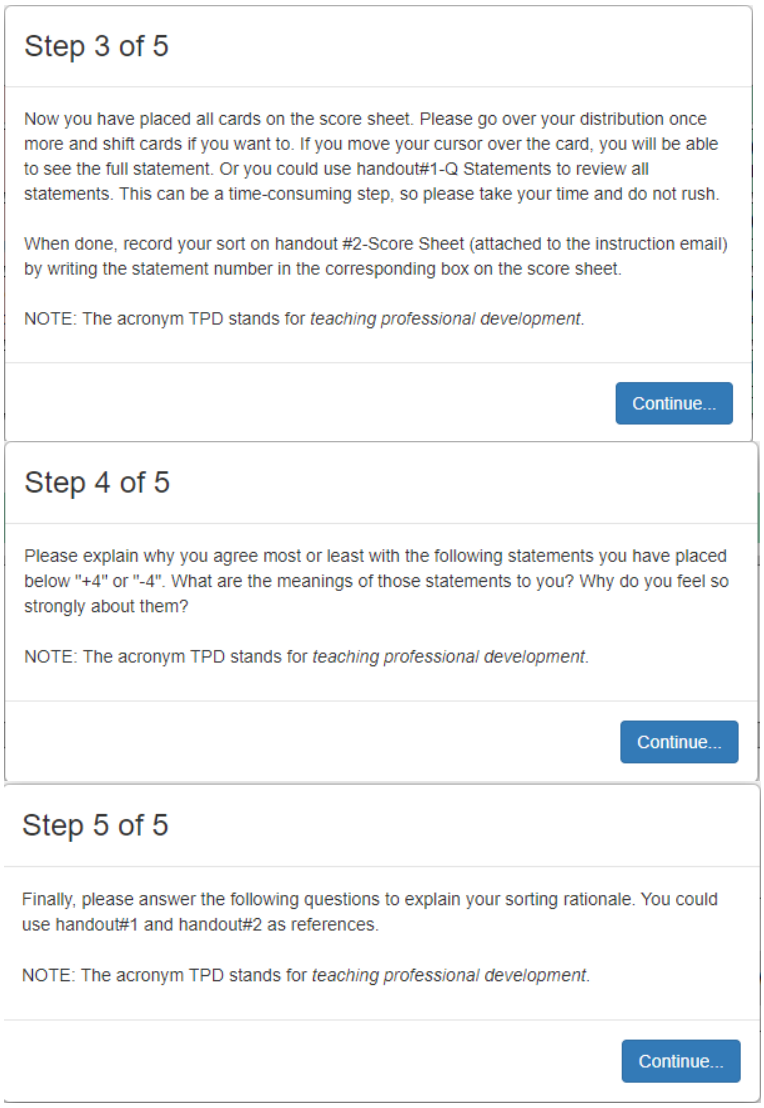
By clicking the "Continue" button below, you acknowledge that you have read the consent form and agree to participate in phase two of the study titled as *Research University Faculty Motivation to Participate in Teaching Professional Development*, with the knowledge that you are free to withdraw your participation at any time without penalty.

Please maximize your browser window and click on the "Continue" button to start the Q-sort.

Q-sort Pages




(6) TPD provides valuable opportunities for me to learn innovative teaching ideas.
1/37
Disagree (#1)
Neutral (#2)
Agree (#3)
Step 2 of 5
Take the cards from the "AGREE"-pile and read them again. You can scroll through the statements by using the scroll bar. Next, select the two statements you most agree with and place them on the right side of the score sheet below the "+4".
Now read the cards in the "DISAGREE"-pile again. Just like before, select the two statements you least agree with and place them on the left side of the score sheet below the "-4".
Next, select the statements you second most/least agree with and place them under "+3"/"-3". Follow this procedure for all cards in the "AGREE"- and "DISAGREE"-pile.
Finally, read the "NEUTRAL"-cards again and arrange them in the remaining open boxes of the score sheet.
NOTE: The acronym TPD stands for teaching professional development
Continue...
Disagree
Agree
-4
-3
-2
-1
0
+1
+2
+3
+4
Disagree
(19) I would only attend TPD if a stipend is offered.
(33) Integrating technology into teaching increases student engagement.
Neutral
(10) TPD helps me to create a personal professional network.
(24) Teaching is my priority compared to research.
(22) Time is the biggest obstacle
Agree
(13) I prefer TPD when it provides on-site technical support.
(16) I prefer TPD when it focuses on my discipline.


Step 3 of 5
Now you have placed all cards on the score sheet. Please go over your distribution once more and shift cards if you want to. If you move your cursor over the card, you will be able to see the full statement. Or you could use handout#1-Q Statements to review all statements. This can be a time-consuming step, so please take your time and do not rush.
When done, record your sort on handout #2-Score Sheet (attached to the instruction email) by writing the statement number in the corresponding box on the score sheet.
NOTE: The acronym TPD stands for teaching professional development.
Continue...
Step 4 of 5
Please explain why you agree most or least with the following statements you have placed below "+4" or "-4". What are the meanings of those statements to you? Why do you feel so strongly about them?
NOTE: The acronym TPD stands for teaching professional development.
Continue...
Step 5 of 5
Finally, please answer the following questions to explain your sorting rationale. You could use handout#1 and handout#2 as references.
NOTE: The acronym TPD stands for teaching professional development.
Continue...

APPPENDIX H. A Brief Introduction to Q Methodology

William Stephenson first introduced Q as a methodology to investigate human subjectivity using a scientific approach in a letter to *Nature* in 1935 (Brown, 1980; Rieber, 2020). As a psychologist, Stephenson (1953) criticized the traditional quasi-quantitative psychological procedures (often referred to as R methodology), such as standardized testing and correlation, which failed to "measure" subjective and qualitative variables of individuals. Early on, Stephenson adopted the traditional R methods to collect data to investigate subjectivity in a fashion similar to that advocated by Burt (Burt & Stephenson, 1939, as cited in Stephenson, 1953). However, he soon realized that R requires variables to be measured in the same unit, which is extremely unlikely for subjective variables, such as attitude and self-esteem (Ramlo, 2016; Watts & Stenner, 2012). The limitation of R in social science studies is that it only focuses on the external standpoint of the researcher and studies all that is objective (Ramlo, 2016).

In response, Stephenson looked for an analysis method capable of examining subjective variables to reveal individual differences within a group of people. Traditional R correlation applied tests to a randomized sample of people from a large population. The focus of R is on significant correlations of "tests, traits, and the like across persons" (McKeown & Thomas, 2013, p. 47) with the assumption that every trait is testable and measurable from an objective standpoint of view. Stephenson (1953) questioned this assumption and the transitive postulate in the R method and claimed it is a root of subjectivity in R. For example, persons A, B, and C completed the same test with scores X, Y, and Z. In R factor analysis, significant correlations between individuals' personal traits, such as gender and their scores, would be sufficient to generate a conclusion, such

as female students often achieve higher test scores than male students. However, the generalized conclusion could not explain the reasons beyond the correlations (e.g., do all female students achieve higher test scores for the same reasons?). Eventually, Stephenson formulated an entirely different data-collection technique, known now as a *Q-sort*, to capture a holistic perspective of an individual's subjectivity (Stephenson, 1953).

Thus, Stephenson (1953) developed a factor analysis approach that considers persons as variables in combination with a sample of viewpoints taken from a population of all possible viewpoints about the topic. This approach was named as a by-person factor analysis because its mathematical structure was derived from Pearson's by-variable factor analysis. By-person factor analysis holds opposite assumptions to the positivist stands that dominated conventional analyses on correlations (Shemmings, 2006). The value of by-person factor analysis in Q is evident when compared to R methods. Variables often refer to the participants' personal traits, such as gender, age, and ethnicity, in an R study. The goal of R studies is to identify significant correlations among objective traits.

In contrast, Q concentrates on the intra-individual and self-referenced significance (Stephenson, 1953). For instance, instead of completing a standardized test, persons A, B, and C would rank a sample of viewpoints from "most important" to "least important" in terms of the psychological significance to themselves. In Q analysis, it is never necessary to assume that what applies to person A is relevant to others. Instead, what matters is the self-referenced significances represented by the researched from a first-person perspective (Brown, 1980; McKeown & Thomas, 2013). These first-person perspectives then help researchers systematically identify clusters of viewpoints within a group of

people across different contexts (Watts & Stenner, 2012). Thus, Q-sort and the by-person factor analysis became the technical foundation of Q methodology.

Stephenson (1953) intended to develop a methodology that pursued the internal view of individuals. Q's philosophical framework describes subjectivity as intrinsic to the person (Brown, 1980). Each Q-sort then represents a person's subjectivity that only the person themselves can capture and reveal (Ramlo & Newman, 2011). The ontology of Q defines realities as occasions of experiences (Stenner, 2011), which overlaps with the fundamental tenet of social constructionism that everyday realities are nurtured from interactions between and among social agents (Berger & Luckmann, 1967). The philosophical agreement between Q and current conceptions of constructionism show that Stephenson was ahead of his time in how in how conventional psychometrics could be used in the study of critical reflection.

However, the development of contemporary qualitative research only began shortly around the beginning of the 20th century (Lockyer, 2008). The conceptualization of social constructionism was brought to wider attention even later than that. The differentiation of qualitative and quantitative was not noted in social and behavioral studies when Stephenson developed Q. Thus, although Stephenson saw beyond R's data deduction technique and wished to represent qualitative differences among individuals' perspectives, his creation of Q was rooted in the positivism traditions common in the first half of the 20th century (Ramlo, 2016). But again, his views foresaw the qualitative traditions that eventually followed.

Q "encompasses a distinctive set of psychometric and operational principles that, conjoined with statistical applications of correlational and factor-analytic techniques,

provides researchers with a systematic and rigorously quantitative procedure for examining the subjective components of human behavior" (McKeown & Thomas, 2013, p. ix). This mixing of paradigms leads to many misconceptions of Q in Q's history which linger on to this day.

The Q community has grown significantly and globally in the past few decades. Researchers in political science (Andersen et al., 2018; Brown, 2019), psychology (Ellingsen et al., 2014; Wolfe et al., 2020), education (O'Connell et al., 2019; Ramlo, 2017; Yildirim, 2017), Medicare (Stenner et al., 2015; N. Zhu et al., 2019), agriculture (Braito et al., 2020; Zobeidi et al., 2016), culture (Durrer et al., 2020) religion (Lassander & Nynäs, 2016; Nynäs et al., 2021), and many other disciplines have accepted Q as a robust methodology. Q is widely used to identify clusters of viewpoints within a group of people and, in turn, compares similarities and differences between different perspectives in social and behavioral studies (Shabila et al., 2014). Q provides a holistic and primary approach for researchers to identify patterns and themes interconnected or related to individuals within a group of people (Watts & Stenner, 2012). Q's advantages make it an attractive option for researchers interested in investigating people's viewpoints on a subjective topic. Researchers in learning, design, and technology, in particular, could use Q for formative evaluation, needs assessment, and learner analysis (Kopcha et al., 2016; Rieber, 2020).

APPENDIX I. Critiques of Q Methodology

The controversial debate around Stephenson's claim on Q as a scientific approach to investigating human subjectivity has continued since Q's birth (Brown et al., 2015; Ramlo, 2016; Rieber, 2020). Both quantitative and qualitative researchers have offered harsh critiques of Q's application in social and behavioral studies and particularly for Q's unique philosophical framework from inside and outside of the Q community. In the discussion of Q's methodological tenets, researchers outside of the Q community often argued that Q studies do not follow conventional quantitative or qualitative methodological principles without a sufficient understanding and recognition of Q's basic premises (Kitzinger, 1998, cited in Stenner & Stainton-Rogers, 2004). Q methodologists then find it is hard to advance meaningful discussions with Q critics when the discussions devolve into arguments, effectively, between positivists and constructivists in social science (Brown et al., 2015; Ramlo, 2016; Stenner & Stainton-Rogers, 2004).

Positivist critics contend Q-sort and by-person factor analysis are techniques that suffer from methodological validity issues. They perceive Q as merely an inverted R data analysis technique and detach Q from its epistemological and methodological context. Many Q methodologists, including Stephenson himself, have tirelessly clarified the relationship between Q and R techniques pointing out that they involve different matrixes of data, different postulates, and distinct methodologies (Brown, 1980, 2017; Brown et al., 2015; Ramlo, 2016; Ramlo & Newman, 2011; Stephenson, 1953). For instance, Kampen and Tamás (2014) offered one of the most recent critiques to Q's concept of internal validity that Q failed to "fulfill its promise of measuring the internal structure of subjectivity" (p. 3).

To be more specific, Kampen and Tamás (2014) claimed that Q's clustering method is mathematically flawed that it cannot represent the greatest extent of possible viewpoints. Kampen and Tamás (2014) proposed a theoretical problem when the number of participants is larger than the number of Q samples the number of provided Q samples would limit the diversity of viewpoints discovered. As an example for their argument, Kampen and Tamás (2014) pointed out that if seven billion people sorted 100 statements, these seven billion people are only allowed to be represented in no more than 100 viewpoints according to Q's mathematic clustering method (Kampen & Tamás, 2014). Mathematically speaking, this is true. However, in response, Q scholars argue that any topic that is understood and considered by even a large group of people would consist of a relatively small number of related and dominant perspectives (S. Brown, personal communication, April 30, 2019). In fact, no Q study in the current literature reported a number of viewpoints that exceeded the number of participants (Brown et al., 2015). Brown et al. (2015) admitted that "any given Q study has finite precision" (p. 531), but this is a challenge for all methodologies. There is no reason to question Q's ability to identify viewpoints due to such worries. Q's practical goal is to help researchers explore the complexity of a concourse and highlight some significant patterns and themes in it (Brown et al., 2015; Robbins & Krueger, 2000).

Q researchers need to make qualitative decisions in several phases in a Q study, such as the development of the Q sample, selection of participants, factor rotation, and factor interpretation. Thus, many positivists are also concerned about the impact of reflectivity on Q's measurement validity (Kampen & Tamás, 2014; Rieber, 2020; Robbins & Krueger, 2000). Though Stephenson did not originally include interview

techniques as an essential procedure for Q studies, modern Q researchers pressed the use of interview accompanying the concourse development and Q-sorting process (Brown, 1993; Shemmings & Ellingsen, 2012; Wolf, 2014). Critics pointed out the researcher's engagement in dialogue with the participants in the sorting and interview context could manipulate participants' representation of their subjectivity in Q-sorts, which eventually affects the objective measurement of Q-sort (Kampen & Tamás, 2014).

From a constructivist inquiry lens, Q studies demand different validity criteria from those inherited from traditional R research. Constructivists "offer perspective and encourage dialogue among perspectives rather than aiming at singular truth and linear prediction" (Patton, 2002, p. 546). Lincoln and Guba (1985) used the term trustworthiness to describe the validity of qualitative inquiry. The criteria to evaluate trustworthiness include credibility (the research process is reported with accurate and rich descriptions), dependability (collection and analysis are consistent), conformability (convergence among multiple and different sources of information), transferability (the potential for similar findings in a different context), and authenticity (researchers fairly represent a range of realities) (Creswell, 2014; Elo et al., 2014; Galman, 2016; Guba & Lincoln, 1994; Lincoln & Guba, 1985). Thus, Kampen and Tamás' (2014) argument on reflexivity issues in Q studies resembled the paradigm war between quantitative and qualitative researchers. Arguments accusing Q of flawed internal validity are not appropriate because Q makes no claim to measure any connections between qualitative variables (Stenner & Stainton-Rogers, 2004).

Q aims to deliver empirical discoveries of a qualitative kind and empower participants to communicate a specific subjectivity realm (Robbins & Krueger, 2000;

Stephenson, 1953; Watts & Stenner, 2012). It is worth noting that the terms *objective* and *subjective* have distinct meanings in Q compared to R methodologies (Brown et al., 2015; Ramlo & Newman, 2011; Stephenson, 1953). Q scholars clarified that Q could not provide "absolute, objective access to the reality of respondents" (Robbins & Krueger, 2000, p. 645). Instead, Q researchers establish internal validity through the iterative interpretation of the results with participants (Robbins & Krueger, 2000). This iterative approach of reducing researchers' reflexivity is commonly used in qualitative studies to ensure the interpretation is rooted in participants' articulation (Connelly, 2016). Q researchers could also incorporate other validity strategies used in qualitative research, such as triangulation, member checking, subjectivity statement, and peer debriefing, to check the accuracy of the findings (Creswell, 2014).

However, although Q has been more recognized within the qualitative community (Ramlo, 2016), some qualitative researchers dislike Q for its mathematical substructure in factor analysis and consider Q as "another atomizing numerology" (Stenner & Stainton-Rogers, 2004, p. 167). Stenner and Stainton-Rogers (2004) argued that Q methodologists, similar to qualitative researchers, experienced dissatisfaction with positivism. They argue it is unfair to criticize Q's epistemological constraints associated with conventional quantitative methods. Q methodologists cultivate and enrich Q along with the development of qualitative methodologies. Modern Q scholars consider Q as a "qualitative dominant mixed-method research" (Ramlo & Newman, 2011). In addition, Brown (1996) observed a wider use of Q due to the development of digital tools that remove some quantitative obstacles for researchers with limited statistical knowledge. Modern Q analysis software, like Ken-Q (Banasick, 2018), is able to handle all of the

complex calculations with a few keystrokes researchers to focus on the iterative interpretation of data.

Moreover, Sneegas (2020), a practicing Q scholar and an experienced qualitative researcher, has recently suggested strengthening Q with more qualitative implementation. Sneegas (2020) identified a significant gap in Q literature that caused "a silence on the conceptualization and role of discourse" (p. 78). Q could be employed to investigate contextual power relations with the integration with critical discourse analysis (CDA), namely Critical Q (Sneegas, 2020). She suggests Q could be improved by introducing CDA at four critical moments of a standard Q practice: 1) concourse and sample development; 2) qualitative data analysis; 3) interpretation of Q-sorts; and 4) interpretation of identified factors. Q's iterative qualities would amplify the benefits of a CDA approach, which offers "a series of critical encounters between the researcher, participants, texts, and discourses" (Sneegas, 2020, p. 82) at each stage of the Q study. Some Q scholars pointed out that Sneegas' (2020) critique deserves special attention within the Q community due to her contribution to "moving Q forward while practicing the suggestions she makes herself in her own Q research" (Rieber, 2020, p. 2545).

In summary, Q scholars often appear to be involved in a never-ending attempt to clarify misconceptions of Q. Stenner and Stainton-Rogers (2004) actually coined the term "qualiquantology" to describe the unique hybridity of quantitative and qualitative in Q's methodological framework. Q offers the advantage of a strong and interconnected mix of quantitative and qualitative methodologies is to investigate contextualized social emotions in a complex reality (Ramlo & Newman, 2011; Stenner, 2011; Stenner &

Stainton-Rogers, 2004). It is likely that the growing acceptance of mixed-methods research in recent years has helped Q gain greater attention outside of the Q community.