EXAMINING THE RELATIONSHIP BETWEEN INDIVIDUAL AND WORK ENVIRONMENT CHARACTERISTICS AND LEARNING TRANSFER FACTORS

Jacqueline E. Kennedy

Dissertation Prepared for the Degree of

DOCTOR OF EDUCATION

UNIVERSITY OF NORTH TEXAS

August 2013

APPROVED:

Kim Nimon, Major Professor
Jimmy Byrd, Minor Professor
Mickey Wircenski, Committee Member
Michael Spector, Chair of the Department of Learning Technologies
Herman Totten, Dean of the College of Information
Mark Wardell, Dean of the Toulouse Graduate School

Kennedy, Jacqueline E. Examining the relationship between individual and work environment characteristics and learning transfer factors. Doctor of Education (Applied Technology and Performance Improvement), August 2013, 90 pp., 10 tables, 4 illustrations, references, 164 titles.

To impact student learning, educators' implementation, or transfer, of new knowledge, skills, dispositions, and practices to daily work is the primary purpose of professional learning. The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics as measured by the Collective Efficacy Scale and Dimensions of Learning Organization Questionnaire, respectively, and learning transfer factors as measured by the Learning Transfer System Inventory. The sample consisted of 249 PK-12 grade school-based instructional staff members of an education association. Canonical correlation and commonality analyses required using the two individual and work environment characteristics of learning culture and collective efficacy as predictor variables of the five learning transfer factors of performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change to evaluate the multivariate between the two variable sets. Learning culture and collective efficacy demonstrated a relationship to resistance to change and performance outcome expectations. Learning culture and collective efficacy were insufficient to transfer-effort performance expectations, attend to performance self-efficacy beliefs, and increase support for transfer (i.e., performance coaching) factors. These findings might guide the decisions and practice of individuals with responsibility to plan, implement, and evaluate professional learning, and provide the conditions necessary for changing educational practice while increasing support for and building educators' confidence about implementation. Further research may confirm the findings and enhance generalizability.

ACKNOWLEDGEMENTS

First, I would like to acknowledge my committee members for their support, time, and flexibility. I respect each one of them tremendously. I especially thank my major professor, Dr. Kim Nimon, for enduring my intensive, accelerated timeline.

I would like to acknowledge those professors who provided practical guidance and advise along the way: Dr. Pamela Scott-Bracey, Dr. Jeff Allen, and Dr. Russell Elleven. Also, I thank Dr. Bill Elieson for taking the time to read multiple draft iterations and for providing me with ongoing feedback and thoughtful questions without ever meeting me in person. A special thanks goes to Amanda Kraha for her optimism, positive reinforcement, research expertise, and consultations: I absolutely could not have made it without you. Additionally, I would be remiss if I didn't thank those who without hesitation wrote references on my behalf for entrance into this program: the late Jack Singley, Dr. Whit Johnstone, and Dr. Carrie Ausbrooks.

I am especially thankful to Learning Forward for granting me access to its members and for its leadership in the field of professional learning. I would like to thank Dr. Shirley Hord, Dr. Bruce Joyce, and Joellen Killion, with whom I consulted for content expertise.

Finally, I want to express my deepest gratitude to my family, friends, and colleagues for always believing in me. The goal of earning a doctorate would not have happened without their unwavering faith, prayers, and encouragement. To friends and co-workers, old and new, I am sincerely thankful for their ongoing assurance that I would make it to the end. To my parents, Johny and Beatrice Kennedy, I am forever grateful for them being the greatest example in every facet of my life. To my sister, Rose, I am appreciative of her endless pride in me. I especially thank my daughter Kennedy for her love and understanding. Most of all, I thank my husband, James, for the countless sacrifices he has made to help me reach this goal.

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

In order to meet student and teacher performance outcomes, teachers are expected to transfer new knowledge, skills, dispositions, and practices acquired in professional learning to their daily work. Little empirical research exists regarding the relationship between individual and work environment characteristics affecting learning transfer factors that influence a climate of implementation, or *transfer* (Holton, Bates, Seyler, & Carvalho, 1997) and apply to schools (Opfer & Pedder, 2011). The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy), and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). This chapter includes the background, need, theoretical framework, and purpose of this study. Delimitations and limitations of the study are also described within this chapter.

Background

Teacher professional learning, also referred to as inservice, training, staff development or professional development, has become a major focus of systemic education reform initiatives (Guskey, 2002), including No Child Left Behind (NCLB) (2001) and American Recover Reinvestment Act (ARRA; 2009). As standards for student performance and teacher effectiveness increase, there is a growing demand for professional learning that links student and educator performance to results and outcomes (Learning Forward, 2011). The increased demand for high-quality, effective professional learning requires a deeper understanding of the dynamic complexities of professional learning systems and models; thus more research is needed (Hargreaves, 2009).

When viewed as a strategic lever and held to high standards, professional learning can improve student achievement results, establish long-term organizational gains, build capacity, and increase educator and school effectiveness (Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). In the *Standards for Professional Learning*, Learning Forward (2011) defined the attributes of and conditions and content for effective professional learning. These standards emphasize that effective professional learning is nested within a culture of continuous improvement and informed by multiple sources and types of data and current research about student and educator learning. When aligned to learning outcomes and performance expectations designated for students and educators, this form of professional learning assures that educator learning leads to student learning, and ultimately increases educator effectiveness and results for all students (Learning Forward, 2011).

Additionally, an effective professional learning system includes support for use and application of new knowledge, skills, dispositions, practices learned; conditions necessary for implementation; and coaching from leaders and colleagues (Wei et al., 2009). Hence, when teachers receive minimal support for implementation and change following professional learning, a greater problem extends beyond the actual learning opportunity (Hall & Hord, 2011; Supovitz & Turner, 2000). As a result, learning can be perceived as of little value when it is not transferred into practice (Timperley & Alton-Lee, 2008). Teachers' individual perceptions are then considered psychological interpretations (Hoy, Tarter, & Kottkamp, 1991) of the workplace environments as inhibiting or supporting learning application and transfer. A lack of change in teacher practice and failure to transfer learning back to the workplace may be the more obvious result. However, it may be a symptom of an underlying issue. When school conditions, culture,

and professional practice do not align with performance expectations and professional learning outcomes (Clarke & Hollingsworth, 2002; Geer & Morrison, 2008; Hall & Hord, 2011).

The impact of this misalignment and lack of coherence can lead to reluctant and confused staff, reduction in innovation, and diminished interest in opportunities to implement new practices (Holton, 2000). Most importantly, it deters teachers and staff from using learning opportunities to realize systemwide, school, and student learning goals, transformation, and continuous improvement (Coppieters, 2005). Consequently, it is only with implementation, or transfer, and practice of learning experiences that educators are able to meet students' learning needs.

Goddard, Hoy, and Hoy (2000) asserted that one of the greatest challenges in school research is explaining how school organizations contribute to student results. One explanation may be found in a school's culture (Schoen & Teddlie, 2008). A learning culture has been identified as a strategic factor for leveraging resources to attain desired outcomes (Bates & Khasawneh, 2005). Consistently, a supportive school culture is viewed as (a) a prerequisite for successful school change and (b) pivotal in driving long-term school and system reform efforts (Fullan, 2001; Hall & Hord, 2011; Little, 1997). A supportive school culture is inclusive of leadership and school effectiveness attributes (Coppieters, 2005; Leithwood & Louis, 1999) as well as collaboration, innovation, and continuous learning at all levels (McCharen, Song, & Marten, 2011). While some schools seek to become learning organizations with that end in mind, implementation efforts are typically not structured or based on research about what constitutes a learning culture (Darling-Hammond & McLaughlin, 1995; Hall & Hord, 2011; Marsick & Watkins, 2003). Combined, learning organization culture and learning transfer are

essential tools for learning and managing knowledge within organizations (Weldy, 2009), and organizations need to create climates that actively encourage transfer (Holton et al., 1997).

Another factor explaining the causal effects of a learning culture is that of collective efficacy (Goddard, Hoy, & Hoy, 2004). According to social cognitive theory, individuals and organizations, by their collective sets of actions, are strongly influenced by efficacy beliefs (Goddard et al., 2004). Thus, collective efficacy may be found within the organizational context of the school and can be attributed to a positive climate (Goddard, Logerfo, & Hoy, 2004). Perceptions of implementation and a learning transfer climate can provide insight into the work environment support mechanisms and individuals' motivation to transfer learning (Hoy, 2012). Therefore, attention to the shared beliefs, norms, and practices held about learning may explain changes in teacher practice following learning interventions. Additionally, researchers have proposed the need to study relationships between collective efficacy and other variables including school improvement, school climate, and professional learning (Ross, Hogaboam-Gray, & Gray, 2004; Tschannen-Moran & Barr, 2004).

Need for the Study

Although learning may be acquired and retained, multiple variables influence learning transfer and can inhibit or support the transfer of learning to daily work (Holton et al., 1997). The combination of deliberate and intentional practices and actions are fundamental to a climate that supports learning transfer (Desimone, 2009; Joyce & Showers, 1981, 2002) because learning is such a dynamic process (Borko, 2008; Desimone, Porter, Garet, Yoon, & Birman, 2002; Fullan, 2001; Hall & Hord, 2011). When considering factors affecting learning transfer, including individual perceptions and beliefs (Bandura, 1993; Guskey, 2002) and work environment influences (Huberman & Miles, 1984; Supovitz & Turner, 2000), catalysts and

barriers can be identified and leveraged or addressed (Holton, Bates, & Ruona, 2000).

Much of the extant literature has failed to move beyond professional learning design qualities and attributes. Research on professional learning has focused primarily on key principles in the design, process, and practice of learning experiences resulting in teachers learning new content and skills (Garet, Porter, Desimone, Birman, & Yoon, 2007; Supovitz & Turner, 2000; Wei et al., 2009). Consequently, the need to examine work environment factors contributing to individual factors affecting learning transfer requires attention (Holton et al., 2000). Specifically, Blume, Ford, Baldwin, and Huang (2010) expressed the "need to know which predictors actually make a difference in facilitating transfer—not just intuitively or anecdotally, but with support from the extant evidence" (p. 106). Similarly, Opfer and Pedder (2011) called for a shift from a cause and effect approach to teacher professional learning to one focused on understanding conditions as well as why and how teachers learn. Muijs (2006) challenged researchers to consider current educational diversity, dynamics, and complexities to identify new models of effectiveness and outcomes in order to provide greater focus on methods for increasing student outcomes (Fielding, 1997; Goldstein & Woodhouse, 2000).

An examination of learning transfer issues requires an understanding of the factors affecting learning transfer and their influence in the transfer process in order to reveal barriers and catalysts to learning transfer (Holton et al., 1997, 2000). In line with the recommendations for further study, this study is designed to fill the gap in the literature regarding individual and work environment factors affecting learning transfer factors as defined by performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change. Such knowledge may provide school, district, and state education leaders with information to take a holistic approach to professional learning

that considers the conditions in which teachers transfer learning to their daily work.

Theoretical Framework

The theoretical framework for this study is Baldwin and Ford's (1988) model of the transfer process. The transfer model helps create a foundation for understanding the transfer of learning process, that takes into account individual characteristics, learning design and delivery, and work environment factors. Central to the model is the concept of learning transfer resulting from inputs, outputs, and conditions that influence the application of learned knowledge and skills to a work context that is maintained over time (Baldwin & Ford, 1988). Baldwin and Ford (1988) built on the earlier work of Noe (1986) and Noe and Schmitt (1986). Baldwin and Ford conducted a literature review of 63 empirical studies published between 1907 and 1987 to examine the effects of transfer of training and developed a framework for understanding the transfer process. Baldwin and Ford described three factors: individual characteristics (e.g., ability, personality, and motivation); training design and delivery (e.g., principles of learning, sequencing, and training content); and work environment (e.g., support and opportunity to use). Additionally, they identified training outputs, which they referred to as outcomes (learning and retention), and conditions of transfer (generalization of knowledge and skills acquired in training to the job and the maintenance of that learning over time).

As shown in Figure 1, Baldwin and Ford (1988) illustrated six linkages that occur in the transfer process to explain how training inputs and output have direct and indirect effects on conditions of transfer. First, all three training inputs of training design and delivery (1), individual trainee characteristics (2), and work environment (3) have a direct effect on training outcomes (learning and retention). Consequently, they have an indirect effect on transfer conditions through their impact on outcomes. Additionally, individual trainee (4) and work

environment (5) have a direct effect on conditions of transfer (generalization and maintenance). Finally, training outputs (6) have a direct effect on conditions of transfer.

As noted in Figure 1, this study is limited to Baldwin and Ford's (1988) model of the transfer process, and does not consider design and deliver inputs or learning and retention outputs and attention to direct influences on transfer conditions has not been required as unique (Blume et al., 2010). Generalization and maintenance are the focus of the model, and transfer of learning cannot be assessed until both conditions are met. As such, this study examined direct influences on conditions of transfer rather than learning and retention. Similarly, design and delivery do not directly influence transfer conditions.

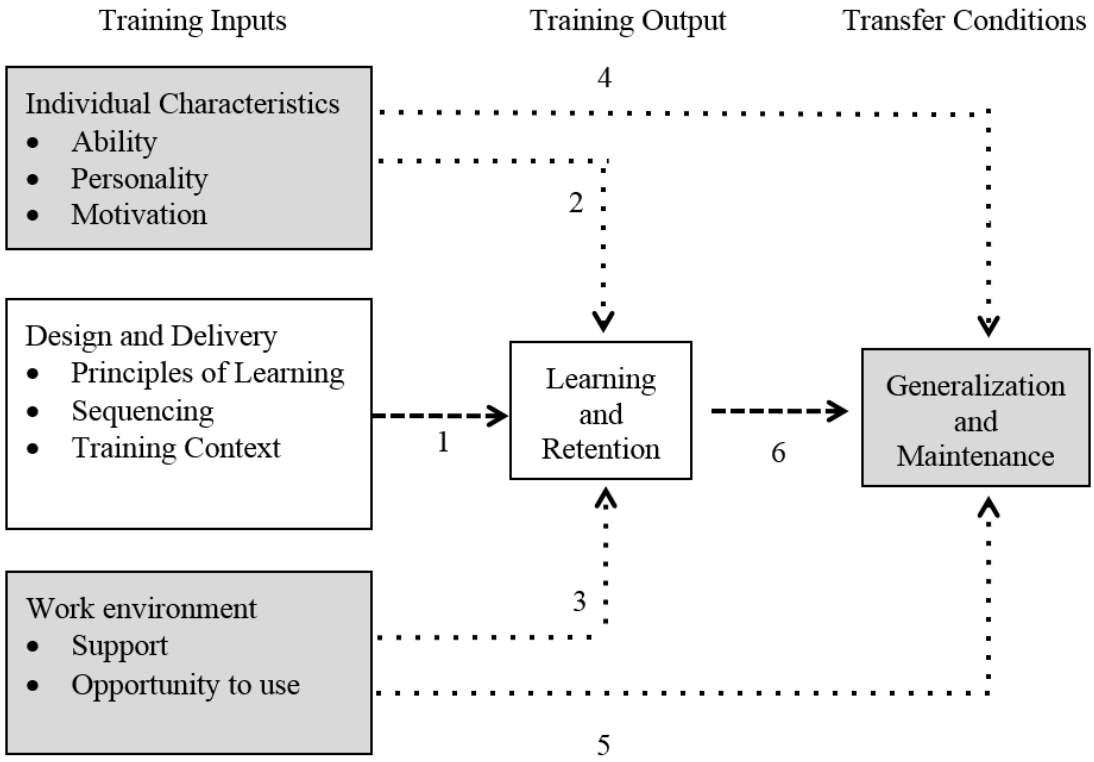

Figure 1. Baldwin and Ford's (1988) transfer process model with the caveat that non-shaded boxes are not represented in this study. Adapted from T. T. Baldwin and J. K. Ford (1988, p. 65). Copyright 1988 by Wiley-Blackwell. Reprinted with permission.

Per the definitions in Figure 1, Baldwin and Ford (1988) found individual characteristics (e.g., collective efficacy) and work environment characteristics inputs (e.g., learning culture) to

have a direct effect on generalization and maintenance (i.e., conditions of transfer and learning transfer factors). Since the models' inception in 1988, various individual and work environment factors affecting transfer of learning have been studied and identified (Blume et al., 2010; Cheng & Ho, 2001; Ford, Smith, Weissbein, Gully, & Salas, 1998). Efficacy beliefs have long been studied as individual characteristics in transfer research (Gist, Stevens, & Bavetta, 1991; Holton et al., 2000; Mathieu, Tannenbaum, & Salas, 1992; Quiñones, 1995). As such, collective efficacy can be identified as an individual characteristic when it is studied at the individual level of analysis (Zellars, Hochwarter, Perrewe, Miles, & Kiewitz, 2001). Respectively, a continuous learning culture has been studied as a work environment characteristic in learning transfer studies (Boreham & Morgan, 2004; Tracey, Tannenbaum, & Kavanagh, 1995).

Purpose of the Study

The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Collective efficacy represented individual characteristics, and learning culture represented work environment; together they were theorized to yield professional learning inputs previously described in the theoretical framework. The learning transfer factors represented individual and contextual factors necessary for generalization and maintenance of learning; it included performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change. Through self-report survey responses, a population of prekindergarten through Grade 12 school-based instructional staff was measured on their perceptions of the school learning culture, collective efficacy, and learning

transfer factors. Each observed variable measured a set of items compiled from three preexisting instruments described in Chapter 3. This study was designed to fill the gap in the literature regarding individual and work environment factors affecting learning transfer in schools using Baldwin and Ford's (1998) transfer process model. The hypothesis for this study follows and is represented by the fourth and fifth linkages discussed in the theoretical framework.

Research Hypothesis

The following was the hypothesis for the study: There is a statistically and practically significant multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) as measured by the Dimensions of Learning Organization Questionnaire (DLOQ) concise version and Collective Efficacy Scale (CE-SCALE) short form respectively, and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change) as measured by Learning Transfer System Inventory (LTSI) training in general construct scales.

Delimitations

The following identified delimitations formed the boundaries of this study:

1. The population for this study was limited to school-based instructional staff. School administrators, paraprofessionals, and system-level staff supporting the school were not surveyed.
2. Learning culture was operationally defined as a unidimensional measure of a learning culture (Yang, 2003) and did not represent the constructive concept of the learning organization (Watkins & Marsick, 1993).

3. Collective efficacy was operationally defined as individual perceptions of collective efficacy (Zellars et al., 2001) and did not represent an aggregate of individual perceptions to the school level (Goddard et al., 2004).
4. Learning transfer factors were operationally defined as perceived task support elements and individual cognitive states (Bates & Khasawneh, 2005) using the five training in general construct scales (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Learning transfer factors did not represent all16 factors of the full LTSI which represented a learning transfer system (Bates, Holton, & Hatala, 2012).

Limitations

Several conditions and influences existed beyond the control of the study and might restrict the study's findings. They are the following:

1. Findings might not be generalizable to nonprofessional association members (Gall, Gall, & Borg, 2003).
2. A preexisting interest in factors affecting learning transfer among participants might increase risk of response bias (Eysenbach & Wyatt, 2002).
3. Methods effects produced by use of a common rater without validation from multiple raters might increase risk for bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Definition of Terms

The following terms were operationalized and defined for achieving the purpose of this study:

Collective efficacy. Represents beliefs about a group's capabilities to organize and execute the courses of action required to produce given levels of attainments (Bandura, 1997).

Performance coaching. The extent to which an individual receives constructive input, assistance, and feedback from people in their work environment (peers, colleagues, supervisors) when applying new abilities or attempting to improve work performance. Feedback may include formal or informal cues from the workplace (Bates & Holton, 2004).

Learning culture. Workplace with the capacity to integrate people and structures in order to move toward continuous learning and change (Watkins & Marsick, 1993, 1996).

Resistance (openness) to change. The extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge acquired in training. This includes an individual's perceptions about his or her work group's resistance to changing the way work is done, their willingness to invest energy to change, and degree of support provided to individuals who strive to use techniques learned in training (Bates & Holton, 2004).

Performance outcome expectations. The extent to which an individual feels confident and self-assured about applying new learning to their jobs and can overcome obstacles that hinder the use of new knowledge and skills on the job (Bates & Holton, 2004).

Performance self-efficacy. The extent to which an individual feels confident and self-assured about applying new abilities in their jobs and can overcome obstacles that hinder the use of new knowledge and skills on the job (Bates & Holton, 2004).

Professional learning. Comprehensive, sustained, and intensive approach to improving educators' effectiveness to raise student achievement (Wei et al., 2009).

Transfer-effort performance expectations. The extent to which an individual believes that applying skills and knowledge learned in training will improve his or her performance. This expectation includes whether an individual believes that investing effort to utilize new skills on

the job has made a performance difference in the past or will affect future productivity and effectiveness (Bates & Holton, 2004).

Summary

This chapter identified the need to examine the relationship between learning culture, collective efficacy, and learning transfer factors as defined by performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change. The chapter provided background on learning transfer as well as Baldwin and Ford's (1988) transfer process model as the theoretical framework for this study. The research hypothesis was shared as the foundation of the study. Chapter 2 presents a review of existing literature relevant to the study.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). The review of literature includes studies addressing individual and work environment factors and learning transfer, with consideration given to Baldwin and Ford's (1988) transfer process model. The literature relating to professional learning design and delivery, and learning and retention was excluded from this review. The examination of seminal and current literature across multiple disciplines was used as the foundation for the hypothesis and purpose of this study.

Learning Culture and Learning Transfer

The concept of a learning culture is well established in scholarly literature. It is one of the most documented work environment factors for accomplishing sustained organizational success (Argyris & Schon, 1996; Senge, 1990; Senge, Kleiner, Roberts, Ross, & Smith, 1994; Watkins & Marsick 1993). With multiple definitions and perspectives on learning culture (Ortenblad, 2002), some have found the construct to be difficult to define and make operational (Garvin, 1993). The aspect of a learning culture has, however, become a mechanism for leveraging change and performance (Yamnill & McLean, 2001, 2005).

In the early organization learning literature, Argyris and Schon (1978) studied the relationship between organization dynamics and individuals. Expanding on their work, Senge (1990) coined the term *learning organization* defining it as an organization in which people continually expand their capacity to create the results they desire. Additionally, Senge identified

five principles of a learning organization built around systems theory: (a) systems thinking, (b) personal mastery, (c) mental models, (d) shared vision, and (e) team/group learning. Senge saw individual learning contributing to organizational learning. Adult learning theorists Watkins and Marsick (1993, 1996) broadened the learning organization concept and developed an analytical framework that is now generally accepted. Within the framework are seven distinct, but interrelated, dimensions of a learning organization culture. These dimensions include the following: (a) creates continuous learning opportunities, (b) promotes dialogue and inquiry, (c) promotes collaboration and team/group learning, (d) empowers people to evolve a collective vision, (e) establishes systems to capture and share learning, (f) connects the organization to its environment, and (g) provides strategic leadership for learning.

In an investigation of individual learning process and continuous organizational knowledge formation, Song and Chermack (2008), through a systematic review of the literature, examined the relationship between culture and learning by showing that learning culture and learning processes were interconnected. Using an integrated research approach, Song and Chermack examined 51 research articles and clustered them into themes. They found that supportive work environment factors (i.e., learning culture) tended to promote effective learning processes and changes in individuals' behaviors and practices. Similarly, Song, Jeung, and Cho (2011) studied learning processes among 720 corporate employees using an online survey regarding the cultural aspects of the learning organization and the three processes of organizational learning (individual, team/group, and organizational). Using structural equation modeling, Song et al. found that the learning organization's environment showed statistically significant influences on all three levels of the learning process: individual ($SPC = 0.35$, $t = 7.52$), team/group ($SPC = 0.16$, $t = 4.08$), and organizational ($SPC = 0.11$, $t = 2.31$). They noted

that the learning organization's environment had a powerful direct influence on individual-level learning based on the observed effect sizes. Thus, Song et al. provided additional empirical support for Watkins and Marsick's (1993, 1996, 1997, 2003) three levels of learning (individual, team/group, and organizational) and two levels of organizational support (people and structural level supports) considered key to creating a successful learning environment. In addition, Song et al. supported the theory that an organization's learning environment impacts organizational learning and the two are separate constructs. Thus, based on preliminary examination, this begins the exploration of the relationship between learning culture and learning transfer factors.

Collective Efficacy and Learning Transfer

The literature on culture and learning includes Bandura's (1986) social cognitive theory as a construct to examine impact and causal relationships. Bandura (1977, 1986) used social cognitive theory to define the construct of efficacy as perceived judgments about self-professed capabilities to achieve specific tasks or goals. Based on his unified theory of behavior change, Bandura (1997) suggested that four sources lead to greater confidence or efficacy beliefs. The four sources are mastery experience, vicarious experience, social persuasion, and affective state. These sources are important in the development of both individual and collective efficacy and operate interdependently.

Mastery experience is the perception of direct successful or failed performance (i.e., past school success) and thus influences expectations that similar future performance will follow. Interestingly, mastery experience includes factors related to attributions to success or failure (i.e., effort) and has been found to be important to organizational learning (Goddard et al., 2004). Vicarious experience, on the other hand, is informed by observations of successful models, including those of schools and successful education programs. By observing the practices of

others achieving goals and attaining valued outcomes, schools, like individuals, are able to learn vicariously about their capabilities. Social persuasion includes encouragement and feedback from credible colleagues and supervisors. Such communication occurs in informal, social, and professional learning experiences and/or in collaborative settings. When coupled with the aforementioned sources, social persuasion fosters collective responsibility and allows organizations to demonstrate high expectations for practice. Finally, affective state refers to the mood of the school, for example through exhibiting levels of stress, excitement, and anxiety, and reveals a school's ability to work resiliently toward desired outcomes (Goddard et al., 2004).

Efficacy studies have shown that perceptions and beliefs significantly contribute to greater understanding of human behavior (Goddard et al., 2000) and to learning transfer (Velada & Caetano, 2007). Collective efficacy derives from the combined set of beliefs that significantly affect individual, team/group, and organizational performance outcomes (Gully, Incalcaterra, Joshi, & Beaubien, 2002). Schein (1997) suggested that collective efficacy builds from the deeper levels of basic assumptions and beliefs shared by members of an organization, operating unconsciously, to define an organization's view of itself and its environment. Collective efficacy manifests itself in the organizational norms suggesting what people should do and how they should accomplish tasks and goals.

Following his definition of self-efficacy, Bandura (1986) originally referred to collective efficacy as group members' perceptions of group competency. Since then, it has been operationalized in many ways. Early definitions referred to collective efficacy as an individual assessment of group capability to complete job-related tasks (Jex & Gudanowski, 1992). Zaccaro, Blair, Peterson, and Zazanis (1995) described it as an individual's beliefs in the team to achieve a desired level of performance. As an early advocate for efficacy applications in

education, Pajares (1992, 1996) argued for meaning and conceptual understanding of teacher belief, calling attention to its application and influence on teacher learning and practice. Later, Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) defined and created a measure for teachers' self-efficacy. Soon after, Goddard et al. (2000) proposed teacher collective efficacy as a separate construct based on teacher self-efficacy and defined collective efficacy as the shared perceptions of teachers perceiving the efforts of the faculty as a whole in a school as having a positive effect on students. Consequently, in social cognitive theory assumes that individuals and organizations (by collective individual actions) are strongly influenced by efficacy beliefs (Goddard et al., 2004), and the theory can be applied to educational organizations (Goddard et al., 2000; Tschannen-Moran et al., 1998).

Over the last decade a number of collective efficacy studies have been published in the education literature. In a multilevel analysis of the relationship between teacher and collective efficacy in schools, Goddard and Goddard (2001) found that teachers' collective efficacy was related to self-efficacy. Participants (n = 452) from a large school district in the Midwest were randomly selected to complete one of two surveys. Half of the group was assessed on teacher and collective efficacy, and the other half received a different survey. School-level variables were controlled using prior means for student math achievement scores and measures of socioeconomic status, student demographics, school size, and attendance for each school. Using a multilevel analysis, a one-way ANOVA with random effects indicated significant variations occurred in teacher efficacy (Var B_{0j}) among schools was 0.04758 (χ^2 =67.33, df = 46, $p < 0.05$), and confirmed that self-efficacy varied systemically with school characteristics. Additionally, the one standard deviation increase in collective efficacy (SD = 77) was associated with an increase in teacher efficacy (SD = 248). Collective efficacy explained 73.5% of the variance

among schools in teacher efficacy. However, the remaining between-school variation including collective efficacy (.012) indicated that collective efficacy predicted all variation in teacher efficacy. This finding confirmed the notion that certain situations might lead to collective efficacy being more important than self-efficacy (Kellett, Humprey, & Sleeth, 2009).

Salas and Cannon-Bowers (2001) recognized collective efficacy as a construct worthy of investigation to understand training interventions and outcomes. Research on collective efficacy has typically detailed team/group effectiveness and performance (Budworth, 2011; Gibson, 2001; Kozlowski & Salas, 1997; Salas, Nichols, & Driskell, 2007). It has also been hypothesized that individual staff members' beliefs about the ability of the team/group and organization are influenced by the culture (Bandura, 1986; Kellett et al., 2009).

Zellars et al. (2001) provided a notable addition to the collective efficacy literature. Zellars et al. studied 188 nurses and the effects of collective efficacy on both organizational and individual outcomes (e.g., self-efficacy, job satisfaction, turnover intent, and emotional exhaustion). Using a multiple regression design and controlling for self-efficacy, Zellars et al. found that collective efficacy, representing the individual beliefs of group competency, was positively correlated ($p < 0.01$) with self-efficacy ($r = 0.22$) and job satisfaction ($r = 0.39$) and negatively correlated with turnover intent ($r = 0.39$) and emotional exhaustion ($r = 0.30$). Interestingly, collective efficacy was shown to influence individual outcomes beyond self-efficacy. These findings provide support for examination of collective efficacy at the individual level, and may challenge contemporary views of collective efficacy as only a shared belief of a group's capabilities.

Similarly, empirical support for individual perceptions of collective efficacy has occurred (Jex & Gudanowski, 1992; Parker, 1994; Riggs & Knight, 1994; Watson, Chemers, & Preiser,

2001). Watson et al. (2001) further clarified that individual perceptions of collective efficacy and self-efficacy are not the same. Nevertheless, collective efficacy can be considered an influential factor of learning transfer. Collective efficacy has a theoretical base for expanding education leaders' understanding of collective efficacy in schools. This inquiry provides the foundation for furthering the hypothesis and examining the relationship between collective efficacy and learning transfer factors.

Factors Influencing a Learning Transfer Climate

The literature on learning transfer and transfer variables is plentiful. According to Weldy (2009), organizations that make learning and transfer a priority impact employee performance, manage knowledge, and promote continuous improvement. As a result, staff members who work in a climate supporting learning transfer recognize the role that organizations, leaders, and peers play in supporting the transfer of new knowledge, skills, and practices into the workplace (Baldwin & Ford, 1988; Bates & Holton, 1995; Holton et al., 2000; Martin, 2010; Rouiller & Goldstein, 1993). Additionally, Bates and Khasawneh (2005) expressed the need for organizations to create an environment that actively encourages transfer of learning.

Holton et al. (2000) identified five training in general factors, not intended to be specific to a training program, likely to influence the transfer climate. These factors include performance self-efficacy (PSE), transfer-effort performance expectations (TEPE), performance outcome expectations (PSE), performance coaching, and resistance to change. These five factors describe transfer conditions necessary for generalization and maintenance of knowledge and skills acquired during learning interventions (Holton et al., 2000). A brief description of each follows.

Performance Self-efficacy

Bandura (1997) defined perceived self-efficacy as ‘‘beliefs in one's capabilities to

organize and execute the courses of action required to produce given attainments'' (p. 3). Additionally, it influences thought patterns and emotions to enable actions for overcoming obstacles that may impede the applying new learning acquired (Bandura, 1986; Bates & Holton, 2004). As a task-specific construct performance self-efficacy is specific to beliefs in one's ability to apply new knowledge and skills (Bandura, 1986; Bates et al., 2000). As such, self-efficacy has been positively related to transfer of learning (i.e., implementing instructional practices; Gist et al., 1991; Guskey, 1988).

Performance Outcome Expectations and Transfer-effort Performance Expectations

Outcome expectancy is the second construct, next to self-efficacy, derived from Bandura's (1986) Social Cognitive Theory and speaks to the likelihood of an outcome. Thus, "when deciding on a course of action, people consider what they stand to gain or lose from performing the behavior" (Williams, 2010, p. 417). However, before Bandura, Vroom (1964) proposed expectancy theory as inclusive of three-part process influencing motivation: effort-performance expectancy, performance-outcome expectancy, and valence. Effort-performance focuses on an individual's perception that effort is positively correlated with performance outcomes, while performance-effort was related to the level of performance. Valence, on the other hand, deals with values of reward. Baldwin and Ford (1988) and Noe (1986) proposed the use of expectancy as a means to understanding training motivation. Brown and Ford (2002) spoke to perceptions of the valued outcomes resulting from transfer of learning. Holton et al. (2000) applied expectancy theory to transfer of learning to measure effort devoted to performance outcomes (i.e., POE) and performance expectations (i.e., TEPE). Scaduto, Lindsay, and Chiaburu (2002) found outcome expectancies had an effect on training outcomes, while Foley (2011) found expectancy to be related to implementation of a reading strategy.

Performance Coaching

Joyce and Showers (1988) found that coaching and feedback played a large role in the learning transfer process. Similarly, Holton et al. (2000) suggested that performance coaching, constructive feedback, input, and assistance from leadership and peers was a necessary factor influencing the transfer of new learning back to the workplace. Along these lines, Guskey (1986, 2002) proposed a model for teacher professional development that suggested ongoing support and feedback were necessary for transfer of learning acquired in professional learning.

Resistance (Openness) to Change

Change has been defined as deliberate and intentional efforts to bring about conversations about differences in events or practices that evolve into something new with the purpose of enhancing individual and organizational results, performance, or outcomes (Choi & Ruona, 2011). Fullan (2001) suggested that a school's leadership along with a schools' culture had major influence on positive change. As it pertains to implementation, or transfer, of new innovations or practices, Hall and Hord (2011) used the metaphor of a bridge to depict the change process to move from current practice to ideal practice. This change process, as it relates to learning and transfer (Darling-Hammond & McLaughlin, 1995; Hall & Hord, 2011; Huberman & Miles, 1984), is influenced by a variety of individual and contextual factors, and includes the processes or strategies by which beliefs and attitudes are transformed (Schein, 1997). Choi and Ruona (2011) proposed that "understanding the conditions conducive to individual readiness for organizational change, instead of the more traditional focus on resistance to change" (p. 46), could be useful for successful change implementation. Similarly, in their seminal study, Hall, George, and Rutherford (1979) found that teachers' expressed their concerns, or ambivalence, rather than resistance to change within the six stages labeled

awareness, informational, personal, management, consequences, collaboration, and refocusing. Holton et al. (2000) found resistance/openness to change to influence individuals' willingness to invest the energy necessary with expectations that support would follow.

Baldwin and Ford (1988) proposed a transfer process model consisting of the three components of inputs, outcomes, and transfer conditions. According to the model, inputs include individual characteristics, training design and delivery, and environment characteristics. Outcomes are learning and retention, and the two conditions of transfer are generalization and maintenance of newly acquired knowledge and skills on the job. These conditions actualize learning transfer into observable behaviors and results (Salas & Cannon-Bowers, 2001). Holton (1996) expanded Baldwin and Ford's model and challenged the seminal training evaluation model developed by Kirkpatrick (1959) by introducing a human resource development (HRD) research and evaluation model. Holton et al. (2000) recognized the significant roles learning and learning transfer played in realizing HRD outcomes. Early models studied to address complexities of learning transfer climate (e.g., Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Rouiller & Goldstein, 1993; Tracey et al., 1995) were determined to be inadequate and too situational by Holton et al. (1997). This conclusion prompted new research to explain, define, and measure individual and work environment factors influences on transfer of learning.

Sookhai and Budworth (2010) studied individual differences related to transfer by investigating the effects of formal supervisor support training and trainee self-efficacy on transfer behavior, they studied 37 new-hire trainees, their respective supervisors, and their peers (n = 32). The trainees attended a work-related training program specific to their job role, and supervisors attended a separate training on the principles of modeling a transfer climate. Trainees completed an online pre-and post-self-efficacy instrument and a transfer climate

questionnaire. The post-self-efficacy assessments were administered following the trainees' first work assignment, and their peers who completed the same assignment were randomly selected to complete a transfer of training questionnaire. Because the supervisors were not blind to the intervention conditions, they were not included in the collection of data even though they were trained to affect the "opportunity to use" and provide support. Using a *t* test, Sookhai and Budworth found statistically significant differences for the two groups regarding the supervisor support condition ($t = 5.60$, $p < 0.00$) but not the control condition ($t = 1.56$, $p < 0.14$). When regressing on the dependent variable (training transfer, $\beta = 0.43$, $p < 0.01$), both the independent (self-efficacy, $\beta = 0.25$, $p < 0.20$) and mediator variables ($\beta = 0.35$, $p < 0.01$) mediated the relationship between self-efficacy and transfer climate (represented by peer evaluations of the trainee). Generally, employees were found to be more likely to transfer training when exhibiting high self-efficacy and having support in the climate to which they returned following experiencing the learning opportunities (Sookhai & Budworth, 2010). This conclusion was similarly supported by a number of researchers (Holladay & Quinones, 2003; Richman-Hirsch, 2001; Smith-Jentsch, Salas, & Brannick, 2001; Tracey et al., 1995).

Recent research on learning transfer provided support for casual effects of the inputs identified in Baldwin and Ford's (1988) transfer process model (e.g., Bates & Khasawneh, 2005; Clarke, 2002; Colquitt, LePine, & Noe, 2000; Lim & Johnson, 2002). Additionally, Grossman and Salas (2011) found that training inputs influence conditions of transfer both directly and indirectly through their effects on training outcomes. A learning transfer climate alone is insufficient to ensure learning transfer and performance. Smith-Jentsch et al. (2001) noted the importance of learning transfer climate as a predictor of the learning transfer and found that the inclusion of feedback and coaching within the learning transfer climate provide an avenue to

enhance support. Smith-Jentsch et al. (2001) and Holladay and Quinones (2003) argued for enabling the combined effects of transfer climates in lieu of independent effects of individual and work environment characteristics, which tend to be independent of one another.

In a study to examine the unique effects of individual characteristics and transfer climate factors on training effectiveness, Tziner, Fisher, Senior, and Weisberg (2007) studied 130 male employees from a large industrial power company. Participants were asked to complete a survey on individual and environment variables following an attended training program. Scores (on a scale of 1-100) earned on the end of course assessment were coded and documented to reflect the participants' levels of mastery. Three weeks following the conclusion of the program, the supervisors were asked to assess the degree to which each trainee made use of the skills developed during training. All individual personality and motivational characteristics yielded significant correlations with training effectiveness measures (i.e., success on the final assessment and supervisor evaluations of learning transfer acquired; Tziner et al., 2007). In further analysis, Tziner et al. found the work environment characteristics of the transfer of training climate positively correlated with both measures of training effectiveness. Interestingly, the study design did not include motivation to learn or any goal orientation variables, even though positive effects for transfer of training climate were reported. Tziner et al. established an alternate theory about perceptions of training having value when assessing training effectiveness. Accordingly, individual and work environment characteristics are important to training outcomes and may represent training inputs that can be studied further. This line of inquiry is extended to the hypothesis by examining the degree to which learning culture and collective efficacy influence learning transfer factors.

Summary

The goal of the present study was to examine the multivariate relationship between learning culture, collective efficacy, and learning transfer factors that influence the transfer climate. The review of the literature guided the notion that individual and work environment factors could affect the transfer of new knowledge, skills, dispositions, and practices to daily work, and can influence the climate necessary for transfer to occur. This chapter presented an overview of the available literature outlining the research on learning culture, collective efficacy, and learning transfer. This study was designed to fill the gap in the literature regarding individual and school factors affecting learning transfer in schools. Chapter 3 presents the methods used in this research.

CHAPTER 3

METHODOLOGY

The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy), and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). This chapter includes details about the research design. Additionally, data collection and data analysis procedures are specified.

Research Design

This study followed a non-experimental, quantitative, correlational research design using a self-report survey instrument. Survey methodology was used to gather information from school-based instructional staff as determined by scores on item sets designed to measure individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). To test the hypothesis for this study, quantitative research methods, general linear model canonical correlation analysis (CCA), and commonality analysis were used for examining the degree to which individual and work environment characteristics relate to learning transfer factors. Descriptive and inferential statistics along with recommended demographic characteristics, essential for generalizability purposes, were collected (American Educational Research Association [AERA], 2006; American Psychological Association [APA], 2009a). To interpret CCA, standardized function coefficients and structure coefficients were assessed. Additionally, commonality analysis was conducted to partition the canonical effects.

Population

Of particular interest in this study were school-based instructional staff members with a working knowledge of individual and work environment factors affecting learning transfer climate. With over 10,000 members, Learning Forward (2011), formerly National Staff Development Council, is currently the only education association dedicated to increasing student achievement results through effective professional learning. Learning Forward made its 2,298 school-based instructional staff members available for this study. As an international professional learning association, its membership extended throughout the United States and abroad. With its long-standing influence, advocacy, and longevity since 1969, Learning Forward provided a membership base ideal for seeking participants for this study. The population for this study included prekindergarten through Grade 12 school-based instructional staff currently members of Learning Forward.

Consistent with the focus of this study on factors affecting learning transfer in schools, the targeted population includes only instructional staff with non-administrative duties working at the school-level. Additionally, to limit the study to instructional staff, only the roles of teacher, coach, instructional specialist, and any title within those categories were targeted for participation. Finally, the population was identified to promote inclusion of multiple contexts for generalizability purposes and included teaching level (elementary, middle, and high school), geographic location (North America and abroad), school size (small, medium, or large), and school settings (rural, urban, and suburban).

Sample

The sampling frame was prepared from the Learning Forward membership database, and presumed to be a random sample. This study employed a convenience sampling method.

Commonly used in education research, a convenience sample represents an easily accessible group, and inferences about generalizability can be made more easily when the sample is well defined (Gall et al., 2003). Of the emails and titles identified, 2,298 school-based instructional staff members were identified based on the criteria previously described. Data obtained for the sample frame were submitted to the supervising investigator for 3-year storage.

Following sample size tables developed by Krejcie and Morgan (1970), the sample size representative of the defined population of school-based instructional staff is 327. In an effort to meet the representative sample, all 2,298 staff included in the population were invited to participate in the study. Because response rates of 20% or lower are not uncommon (Witmer, Colman, & Katzman, 1999), there was potential for the representative sample not to be met if other sampling methods (e.g., random sample) are conducted.

The sample size necessary for statistical significance could not be determined using power analysis. In lieu of the missing software available to generate power analysis for CCA, Tabachnick and Fidell (2001) recommended 10 cases for every variable with a reliability of about .80. This formula required a sample size of 140 for the current study, reflecting seven observed variables. However, as previously noted, when reviewing the sample size needed to represent a population, the sample size estimates were increased.

Instrumentation

The selected method for performing this study was survey research. Based on previously described criteria, selected participants received a link to the survey. The survey included three pre-existing instruments and related demographic characteristics. These instruments were Dimensions of Learning Organization Questionnaire (DLOQ) concise version (Yang, 2003), Collective Efficacy Scale (CE-Scale) short form (Goddard, 2002), and Learning Transfer System

Inventory (LTSI) version 4 training in general construct scales (Bates et al., 2012). Reduced-item versions of the full-length DLOQ and CE-SCALE instruments were selected, and only items from the LTSI 5 transfer in general construct scales (Holton et al., 2000) were used. Ratings generated from Likert scales were assumed to be continuous. Despite longtime debate about its use and misuse (Jamieson, 2004), it has been deemed appropriate for Likert type scale ratings to be used as continuous data for statistical analysis (Carifio & Perla, 2008).

The survey consisted of 43 items and five sections. Sections were informed consent, one representing each of the three instruments used in the study, and demographics. Informed consent always appeared first and demographic information last. Information on incentives followed the last section of the survey. As recommended by APA (2009a), demographic data were always presented to participants at the end of the survey. Table 1 provides a summary of the variables of this study, the item sets designed to measure each variable, and the source of the items.

Dimensions of Learning Organization Culture Questionnaire (DLOQ) Concise

Learning culture was measured using a 7-item unidimensional DLOQ concise version developed by Yang (2003) based on the full 21-item DLOQ (Watkins & Marsick, 1997). The DLOQ concise version measures perceptions of learning organization culture using a 6-point scale ranging from 1 (*almost never*) to 6 (*almost always*). One item from each of the seven learning organization subconstructs is represented in this model. These subconstructs are continuous learning, dialogue and inquiry, team learning, empowerment, embedded system, system connection, and strategic leadership. An average of item score for each of the seven items created one score of learning culture. A sample item included: "In my organization, people are rewarded for learning."

Table 1

Descriptions of the Instruments Incorporated into the Survey

Section	Variables	Items	Scale
LC	Learning culture (DLOQ; Yang, 2003)	7	1-6 scale, beginning with *almost never* to *almost always*
CE	Collective Efficacy (CE-SCALE; Goddard, 2002)	12	1-6 scale, beginning with *strongly disagree* to *strongly agree*
LT	Learning Transfer (LTSI; Bates et al., 2012)		1-5 scale, beginning with *strongly disagree* to *strongly agree*
	Performance self-efficacy	3	
	Transfer-effort performance expectations	3	
	Performance outcome expectations	3	
	Performance coaching	3	
	Resistance to change	3	
	Instrument Item Count Total	34	

Yang (2003) reported sufficient validity and reliability data. To examine the construct of learning culture, Yang identified a nonrandom sample of 836 subjects from a data set used from multiple construct validation studies from multiple organizations. The sample was divided into two equal groups (n = 418), serving as exploratory and confirmatory samples. The model generation method was used to test the exploratory sample resulting in the shortened version. Retained items were tested with the validation sample to ensure adequacy. Construct validity was examined using structural equation modeling to assess model-data fit. Goodness of fit Indices fell above .90, and all estimated coefficients were statistically significant at the level of $p < .05$. Findings supported the concise seven-item version as an appropriate alternate measure of

learning culture (Marsick & Watkins, 2003; Yang, 2003). Reliability estimates for the unidimensional scale produced an adequate Cronbach α coefficient of .84.

Collective Efficacy Scale (CE-SCALE)

Collective efficacy (CE) was measured with the 12-item single-factor Collective Efficacy Scale (CE-SCALE) short form developed by Goddard (2002). The 12-item measure is based on the 21-item CE-SCALE (Goddard et al., 2000). The CE-SCALE measures individual teacher perceptions of staff capability of positively influencing student learning using a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Items are directed at either the assessment of group competence (GC) or task analysis (TA), and are identifiable as either positively (+) or negatively (-) worded. The CE-SCALE includes items related to both group competence (GC) and task analysis (TA). The four types of elements included in items are GC+, GC-, TA+, and TA-. Three items represent each of the four elements. Participants made judgments about the whole faculty when responding to questions. The average item score for each of the 12 items created one score of collective efficacy. A sample item included: "Teachers in this school are able to get through to difficult students."

Goddard (2002) assessed criterion-related and predictive validity for the single factor of collective efficacy using a sample of teachers (n = 452) from 47 different schools. Using Pearson r scores from the original CE-SCALE and the short form for criterion-related validity hierarchical linear modeling (HLM) using scores from the short form were assessed in a multilevel model to determine predictability and predictive validity. Factor structure coefficients for the 12-item scale ranged from .67 to .91, with strong correlation estimates reported (r = .983) in comparison to the original scale. Findings reported equally effective and valid use of the 12-item scale, as were previously found in the original 21-item scale. Additionally, internal

consistency analysis indicated that all items loaded strongly on a single factor and explained .641 of the item variation. Results from the same study found a strong reliability coefficient α of .94 for the 12-item single scale. Goddard showed the CES to have high internal consistency (α = .94).

Learning Transfer Systems Inventory (LTSI) Training in General Construct Scales

Learning transfer was measured with 15 items from version 4 of the Learning Transfer Systems Inventory (LTSI) training in general construct scales developed by Bates et al. (2012). The full LTSI represents two constructs: specific training and training in general. For the purpose of this study, only the instrument domain that represented general factors that might influence any training program was used. LTSI training in general construct scales measured individual perceptions of catalysts and barriers to work-related training using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The LTSI training in general construct scales measured perceptions of individual and contextual factors influencing learning transfer and transfer conditions.

Three items from each of the five training in general subscales are represented in this model. Subscales are performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change. Three negatively worded items (representing resistance to change) were reversed-scored prior to data analysis. An average of item score for each of the 15 items created one score of learning transfer climate. A sample item from each subscale included: for performance self-efficacy, "I never doubt my ability to use newly learned skills on the job"; for transfer effort-performance expectations, "My job performance improves when I use new things that I have learned"; for performance outcomes-expectations, "When I do things to improve my performance, good things

happen to me"; for performance coaching, "People often make suggestions about how I can improve my job performance"; and for resistance to change, "People in my group are not willing to put in the effort to change the way things are done."

Bates et al. (2012) studied participants (n = 5,990) from 17 countries that recently attended or were attending organization-sponsored training programs. Findings provided strong support for the five-factor structure of the general training construct scales using version 4 of the LTSI. Data from the full sample were divided into two equal groups (n = 1488), serving as exploratory and confirmatory samples using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), respectively. Using SPSS, Bates et al. reported that strong factor loadings ranged from .52 to .83. Additionally, low-to-moderate correlation estimates were reported ranging from .00 to .55, with an average inter-scale correlation of .24. Subsequently, common factor analysis evaluated was assessed twice using AMOS 7. Common factor results for the first analysis tested EFA results and indicated a good fit ($p < .001$; $x^2 / df = 3.29$; $CFI = .95$; $TLI = .94$; $IFI = .95$; $RMSEA = .04$).

The second analysis tested the final model. Factor pattern coefficients for general training ranged from .57 to .85, with an average of .73. Overall, findings provided strong support for the 5-factor general training domain (Bates et al., 2012). Bates et al. (2012) reported reliability estimates yielding α coefficients of .75 for performance self-efficacy, .75 for transfer effort performance expectations, .72 for performance outcome expectations, .85 performance coaching, and .80 for resistance to change.

Demographics

Nine items, developed by the researcher, collected this information from participants and aided in considerations of external validity. Items appeared at the end of the survey and

followed APA (2009b) sample characteristic guidelines for race/ethnicity, gender, and age. A detailed description of each of these variables is presented in Table 2.

Table 2

Study Demographic Data

Category	Response Options (Data Code)
Current Primary Position	Regular or General Education (1) Special Education (2) Bilingual/ESL Education Teacher (3) Gifted Education (4) Career and Technical Education (5) Teacher Leader or Coach (6) Instructional Specialist or Support Staff (7) Other (8)
School Level	Elementary School (1) Middle School (2) High School (3)
School Setting	Rural (1) Urban (2) Suburban (3) Charter (4)
School Student Enrollment	0-500 (1) 501-1,000 (2) 1,001-1,500 (3) 1,501-2,000 (4) Over 2,001 (5)
Gender	Male (1) Female (2)
Year of Birth	1925-1945 (1) 1946-1964 (2) 1965-1979 (3) 1980-2000 (4)
Highest Completed Education Level	Less than High School (1) High School (2) Associates Degree (3) Bachelor's Degree (4) Master's Degree (5) Doctoral Degree (6) Advanced Professional Degree (7)
Total Number of Years in Education	Beginning Teacher (0 Years) (1) 1-5 (2) 6-10 (3) 11-20 (4) Over 20 (5)

(table continues)

(continued).

Category	Response Options (Data Code)
Race/Ethnicity	White (1) Black or African American (2) Asian (3) Hispanic (4) American Indian or Alaskan Native (5) Native Hawaiian or other Pacific Islander (6) Other (7)

Pilot

A pilot study was conducted prior to beginning data collection. A convenience sample was drawn from University of North Texas (UNT) department of learning technologies students and school-based staff known by the researcher. School-based instructional staff members were included for their similarity to the population. Participants were contacted using the participant invitation email including the link to the survey, and they were asked to voluntarily complete the entire survey for two purposes. First, participants were asked to report spelling and grammatical errors and to provide feedback and recommendations on any part of the survey that was unclear or confusing. Second, survey features were assessed, including block randomization for random order of variables, survey flow, and end of survey branched items.

The pilot study was conducted from Thursday, February 21, 2013, through Monday, February 25, 2013. Thirteen pilot study participants completed the survey and provided feedback and recommendations. The pilot sample included six doctoral students, three principals, and four teachers. Pilot participants' feedback was used to refine the survey prior to data collection. Data were not scored. Qualtrics modifications were made to address usability. Changes to the survey were submitted for IRB approval and approved prior to data collection.

Data Collection

The Institutional Review Board (IRB) process was completed and approved through the UNT prior to data collection. In accordance with IRB standards and practices, the identified sample received a pre-notification email on Wednesday, February 27, 2013, with a brief explanation of the study, its purpose, and the survey process. According to Pereira, Bruera, and Quan (2001), higher response rates can be obtained when pre-notification is targeted to a specific audience. Prenotification is intended to alert prospective participants of the survey and to peak interest. Sheehan and McMillan (1999) asserted that when surveys are interesting to participants, response rates increase. Prenotification also builds trust, and reduces intrusion of physical privacy (Cho & LaRose, 1999). Therefore, a prenotification email was distributed prior to the official invitation.

On Monday, March 4, 2013, the identified, potential sample received an email notification with the hyperlink to the Web-based survey created using university-sponsored Qualtrics survey software (Qualtrics Inc., Provo, UT). Although Sauermann and Roach (2012) reported no significant differences in response rates across days of the week and time of day, Web survey design methods were followed to optimize response rates. Qualtrics was selected as the survey software to present a credible survey to participants because of its automatic presentation of the UNT banner and university identification at the beginning of the survey domain. Cho and LaRose (1999) contended that appearance of a recognized and creditable source is one way of addressing privacy concerns and increasing response rates.

To demonstrate trustworthiness and information privacy, participants were made aware of confidentiality of data and anonymity measures for complete disclosure (Cho & LaRose, 1999). Information contained within the survey did not allow for identification of participants or

require sensitive judgments about their school. As an additional safeguard, survey responses were stored in Qualtrics and were password-protected. As recommended for survey design quality (Andrews, Nonnecke, & Preece, 2003), the first page of the survey included the informed consent disclosure with information about the university, researcher, confidentiality of the data, and freedom of recipients not to respond. Participants accepted or declined participation before receiving access to the first survey item. Respondents were made aware that the survey would take approximately 10 to 15 minutes to complete.

Each of the three variable sections was presented to participants in random order, as a selected feature of the Qualtrics web-based survey software to reduce common method variance (CMV; Reio, 2010). CMV speaks to the variance attributed to the measurement rather than measured constructs, and has potential to introduce bias when a common source is used (Campbell & Fiske, 1959; Podsakoff et al., 2003). Consistent with recommendations by Reio (2010) procedures were followed to minimize the likelihood of CMV bias, including counter-balancing the section order of variable questions. Additionally, placement of navigation buttons followed recommendations by Romano and Chen (2011), including presenting the *Next* button on the bottom right of each page, because items are presented vertically and left justified. No *Back* button was provided.

Consistent with Dillman (2000), participants received a follow-up email one week after the opening of the survey window on Monday, March 11, 2013. Only one follow-up email was sent to decrease the likelihood of annoying potential participants and increase the likelihood of participation (Solomon, 2011). Given the significantly faster response times reported for Web surveys (Dillman, 2000), participants were given a total of 2 weeks to complete and submit the survey. The survey window closed on Friday, March 15, 2013, at 5:00 PM. All data from the

survey instrument were coded and entered into a computerized data file. The electronic data were stored in a password-protected computer accessible only to the researcher. Once the data file was prepared, LTSI data were released for scoring to one of the authors, Reid A. Bates, as part of the user agreement to retain all scoring algorithms.

An incentive system was used to encourage participation. Participants completing the survey had an opportunity to request a copy of survey results. Andrews, Nonnecke, and Preece (2003) observed that those participating in a survey are interested in the results. Additionally, participants were offered the opportunity to enter a lottery drawing to win one Amazon 16GB HD Kindle Fire or one of ten $10 Amazon gift cards. While prepaid monetary incentives have shown to have a significant positive effect on response rates (Church, 1993), there is support for lottery drawings as an incentive (Deutskens, De Ruyter, Wetzels, & Oosterveld, 2004). Participants electing to enter the lottery drawing provided a valid email address to be used for contact with winners. Contact information was handled separately from the data set. Emails were transferred to a spreadsheet, numbered, and sorted alphabetically. Using random number-generating software, Research Randomizer 4.0 (Urbaniak & Plous, 2011), 11 numbers were randomly selected. Emails corresponding to the selected numbers were declared winners. The first 10 numbers were used to determine winners of the Amazon gift cards, and the final number determined the winner of the Amazon 16GB HD Kindle Fire. The drawing took place 3 weeks following the closing of the data collection window, and winners were contacted on Friday, April 5, 2013, by email; and gift cards. The Kindle Fire was shipped directly from Amazon.com to the winner. Email addresses obtained through the lottery drawing process were destroyed following the drawing.

Data Assessment

The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Descriptive statistics were calculated and examined for statistical assumptions.

To test the hypothesis of this study, general linear model CCA and commonality analysis were performed using SPSS version 20.0, along with macro and SPSS script files (Nimom et al., 2010). CCA was performed on individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Due to the multifaceted nature of the variable sets and to reduce Type I error (Thompson, 2000), CCA was determined to be more appropriate than multiple linear regression. Further, commonality analysis was used to explain fully the canonical effects produced by individual and work environment (learning culture and collective efficacy) variables and to partition the variance produced from learning transfer factors. Therefore, CCA and commonality analyses represented the most appropriate methods for analysis. As the statistical measure for this study, CCA ensured appropriate examination of the relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change) and address the hypothesis.

Commonality analysis provided a more complete assessment of canonical effects even

when predictor and criterion variables were collinear (Nimon, Henson, & Gates, 2010). Thompson (2009) explained: "Collinearity (or multicollinearity) refers to the extent to which the predictor variables have non-zero correlations with each other" (p. 234). Together, CCA and commonality analysis served to determine the degree to which individual and work environment characteristics (learning culture and collective efficacy) explained statistical and practical variance in learning transfer factors as measured by LTSI training in general construct scales. *P* values and Wilks's lambda (Λ) were used to determine statistical significance for *r* and R^2_c, respectively and effect size and confidence intervals for practical significance.

Wilks's Λ represents the proportion of the total variance in the discriminant scores not explained by differences among the groups (Stevens, 2009). If the chi-square (χ^2) statistic corresponding to Wilks's (Λ) was statistically significant, a canonical relationship between the variables sets was observed. As recommended by APA (2009a) and Sherry and Henson (2005), effect size was assessed along with confidence intervals to support practical significance and generalizability to the total population. A value of $p < .001$, *r* and R^2_c effect sizes of .24, and confidence intervals of 95% were used.

Data Screening

Once all participant responses were collected, data preparation and screening were conducted. Responses were exported from Qualtrics and imported into SPPS software for initial data screening and analysis. Traditionally, a combination of non-reversed (positively worded) items and reversed (negatively worded) items was encouraged because of their advantages (Nunnally, 1978; Nunnally & Bernstein, 1994). However, concerns have been raised about the effect of negatively worded items (Herche & Engelland, 1996) and unexpected factor structures (Schriesheim, Hinkin, & Podsakoff, 1991) reducing scale reliability. To address these concerns,

three negatively worded items found in the LTSI training in general construct and five items found in the CE-SCALE were reverse coded prior to data analysis. Additionally, Tabachnick and Fidell (2001) recommended addressing missing data and outliers. Consistent with Allison (2002), listwise deletion was used to address missing data. Forced response was used as part of the capabilities of the Web-based survey software. Each item required a response forcing participants to respond to an item prior to proceeding to the next item. Although forced response can impact response rates and dropouts in Web-based surveys (Stieger, Reips, & Voracek, 2007), an advantage to its use is decreased item nonresponse (Dillman, 1988).

Assumptions

Prior to conducting CCA, statistical assumptions of general linear models were addressed. Basic assumptions for general linear modeling include randomization, independence, reliability, measurement level, and normality (Nimon, 2012). However, Burdenski (2000) identified multivariate normality as a primary assumption to test when conducting general linear model analysis. Multivariate normality was addressed using scatterplots of Mahalanobis distance (D^2) against χ^2 for each variable response. Mahalanobis D^2 detects scores that deviate from the mean (above or below) for a group of variables as a set (Burdenski, 2000). In the case of multivariate assessing normality, Mahalanobis D^2 at the $p < .001$ level is considered extreme (Tabachnick & Fidell, 2001). Extreme responses were examined further.

Reliability and Validity

To assess the reliability of observed variables, α coefficients were generated (Cronbach, 1951). A coefficient α between and .80 is considered acceptable (Nunnally, 1978). Construct validity was addressed using exploratory factor analysis. Factor loadings of .55 and above are considered good (Comrey & Lee, 1992)

Data Analysis

Canonical Correlation Analysis

CCA was performed using a macro located in the SPSS installation directory (i.e., canonical correlation.sps). Interpretation of CCA results included analysis of structure coefficients in addition to standardized function coefficients as suggested by Nimon et al. (2010). Standardized function coefficients represent the credit given to a predictor in the canonical equation. Nimon et al. (2010) found them to be an appropriate place to begin examining the contributions of variables to the regression equation. Next, an analysis of structure coefficients was used to determine the relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors, without the influences of other variables (Nimon & Reio, 2011). Structure coefficient values ranged from -1.0 to +1.0; negative numbers represent a negative correlation, and positive numbers represented a positive correlation. Values equaling zero indicated that a relationship was not present between studied variables. Results addressed the hypothesis and explained statistical and practical variance regarding learning transfer factors.

Commonality Analysis

Further analysis of canonical effects was performed using commonality analysis. Using an SPSS commonality macro (Nimon et al., 2010), commonality analysis was performed. Commonality analysis was added to CCA interpretations and further addressed the hypothesis. By fully reporting the canonical effects into common and unique effects by canonical variates, commonality analysis provided a more complete assessment of canonical effects beyond that of standardized function coefficients and structure coefficients (Nimon et al., 2010). Results were

used to address the hypothesis and determine the degree to which learning culture and collective efficacy explained statistical and practical variance in learning transfer factors.

Summary

This chapter discussed the research design, population, sample, instrumentation, data collection, and data analysis procedures required to answer the research questions for this study. Results for all analyses are reported in Chapter 4. Chapter 4 presents a discussion of descriptive, inferential, and quantitative analyses, and evaluation of the hypothesis.

CHAPTER 4

RESULTS

The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). This chapter includes the results of this study including, data assessment, and analysis. Finally, this chapter evaluates the hypothesis for this study.

Data Assessment

Data were collected according to the procedures outlined in Chapter 3. At the conclusion of data collection, the data were reviewed for completion and appropriateness. Data were submitted and scored by Learning Transfer System Inventory (LTSI) author, Reid Bates, as agreed. Missing data, reverse scoring, and sample size concerns were addressed. Statistical assumptions, reliability, and validity were acknowledged and met.

Sample Size

Invitations were sent to 2,289 staff members, and 311 responses were received for a response rate of 14%). Eight respondents dropped out of the survey prior to answering the first question, and another 10 declined upon accessing the informed consent. Of the 293 remaining, 42 were removed from the data, because respondents held positions not included in this study (34 principals and assistant principals and 8 district central office staff). Consistent with Allison (2002), two responses were removed from the data. Listwise deletion was used to address 2 participants missing responses to all nine demographic items. Missing data accounted for less than 1% of the data collected. Removal of items did not represent a significant reduction in the

sample size, and therefore imputation methods were not conducted. Remaining data (n = 249) comprised the final sample of school-based instructional staff.

An assumption was made that by including the entire population in the sample, a greater chance of meeting the 327 representative sample size would occur (Krejcie & Morgan, 1970). Nevertheless, the sample easily met the minimum 10 cases recommended for each variable in order to interpret statistical and practical significance when using canonical correlation analysis (CCA; Tabachnick & Fidell, 2001). The participant to variable ratio for this study was 35 to 1.

Table 3 provides additional information about demographic characteristic, and Table 4 provides information about the sample's school characteristics. The majority of school-based instructional staff members were White (85.1%), female (89.2%), and holding a master's degree (71.9%). Most were born between 1965 and 1979 (45.4%), had over 20 years of teaching experience (40%), and held a primary position as teacher leader or coach (43%). Additionally, 51% of all staff worked at the elementary level located in an urban setting (43%), with student enrollments between 501 and 1,000 (37.8%).

Reverse Coding

Reverse scoring was completed on LTSI and Collective Efficacy Scale (CE-SCALE) items as described in Chapter 3. Negatively worded items, were reversed-scored prior to data analysis. Three items (7, 8, and 9) represented resistance to change on the LTSI training in general construct scales. Six items (10, 11, 15, 16, 18, and 19) were from the CE-SCALE short form.

Table 3

Sample Demographic Characteristics (n = 249)

Characteristic	*N*	%
Current Primary Position		
Regular or General Education	77	30.9
Special Education	12	4.8
Education Bilingual/ESL	5	2.0
Gifted Education	1	.4
Career and Technical Education	1	.4
Teacher Leader or Coach	107	43.0
Instructional Specialist or Support Staff	31	12.4
Other	15	6.0
Gender		
Male	27	10.8
Female	222	89.2
Year of Birth		
1946-1964	101	40.6
1965-1979	113	45.4
1980-2000	35	14.1
Highest Completed Education Level		
Bachelor's Degree	36	14.5
Master's Degree	179	71.9
Doctoral Degree	20	8.0
Advanced Professional Degree	14	5.6
Total Number of Years in Education		
1-5	7	2.8
6-10	45	18.1
11-20	97	39.0
Over 20	100	40.2
Race/Ethnicity		
White	212	85.1
Black or African American	18	7.2
Asian	3	1.2
Hispanic	10	4.0
Native Hawaiian or other Pacific Islander	2	.8
Other	4	1.6

Table 4

Sample School Characteristics (n = 249)

Characteristic	*n*	%
School Level		
Elementary School	128	51.4
Middle School	45	18.1
High School	76	30.5
School Setting		
Rural	54	21.7
Urban	107	43.0
Suburban	84	33.7
Charter	4	1.6
School Student Enrollment		
0-500	86	34.5
501-1,000	94	37.8
1,001-1,500	22	8.8
1,501-2,000	22	8.8
Over 2,001	25	10.0

Validity and Reliability

Construct validity was examined using EFA. The criteria by Comrey and Lee (1992) recommended each instrument have factor loadings greater than .55. EFA explained the maximum amount of shared variance with the fewest number of representative concepts (factors; Kieffer, 1999). Principal axis analysis was conducted using a nonorthogonal (oblique) promax rotation followed (Tabachnick & Fidell, 2001). Factor loadings for learning culture (LC) ranged from .62 to .86 and .60 to .83 for collective efficacy (CE) and showed good reliability for this

data set with Cronbach's αs of .88 and .87, respectively. Factor loading ranges and Cronbach's α for LTSI training in general factors were: .57 to .82, α = .72 for performance self-efficacy (PSE); .65 to .86, α = .79 for transfer-effort performance expectations (TEPE); .55 to .82, α = .73 for performance outcome expectancies (POE); .79 to .88, α = .88 for performance coaching (PC); and .56 to .95, α = .83 for resistance to change (RC).

Items for exclusion on scales were based on α improvement. One item (#12) included in the scale PSE had a coefficient of .57. When it was removed from analysis, the coefficient for PSE increased from .69 to .72. Therefore, Item 12 was excluded from the analysis. The other two low loading factor items were Item 7 (.56) measuring resistance to change (RC), and Item 6 (.55). Although the α for Item 7 increased from .83 to .89 when the item was removed, the increase was not considered a significant improvement because the α coefficient was already above the cutoff. Additionally, Item 6 decreased from .73 to .71, when removed. Therefore, Items 7 and 6, and their respective scales, RC and POE were left intact. As shown in Table 5, all scales produced reliability estimates (Cronbach α) ranging from .72 to .88, and all fell in the acceptable range (Nunnally & Bernstein, 1994). Additionally, all factor loadings ranged from .55 to .95 and were considered to have good construct validity (Comrey & Lee, 1992).

A second-order factor of transfer climate was found not to represent the five training in general scales variables (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change) as described in Holton et al. (2010). Reliability coefficient for the latent variable, transfer climate (α = .49) was well below .70 and was determined to be not acceptable for this study. As such, all five constructs were measured as five separate variables in this study and were represented in the learning transfer factors canonical variate in the canonical correlation analysis.

Descriptive Statistics

Tables 5 and 6 show descriptive statistics for all observed variables in the study. Two-tailed correlations between learning culture (LC), and all other variables were positive and statistically significant ($p < 0.01$), except performance coaching (PC; $r = .16$, $p < 0.05$). While most of the correlations with learning culture were practically significant ($r = .24$) and ranged from .26 to .62 performance coaching did not achieve practical significance PC; $r = .16$, $p < 0.05$, and performance self-efficacy (PSE; $r = .20$, $p < 0.01$) demonstrated borderline practical significance by falling just below .24 (Rosenthal & Rubin, 2003). Correlations between collective efficacy (CE) and the variables for LC ($r = .45$), POE ($r = .26$), and RC ($r = .51$) were positive and both statistically ($p < 0.01$) and practically significant ($r = .24$).

Table 5

Correlation Matrix (n = 249)

Measure	1	2	3	4	5	6	7
1. LC	(.88)						
2. CE	.445**	(.87)					
3. PSE	.204**	.085	(.72)				
4. TEPE	.260**	.043	.303**	(.79)			
5. POE	.617**	.258**	.193**	.344**	(.73)		
6. PC	.159*	.088	.031	-.037	.128*	(.88)	
7. RC	.489**	.510**	.186**	.101	.350**	.169**	(.83)

Note. *Correlation is significant at the $p < 0.05$ level (2-tailed). ** Correlation is significant at the $p < .001$ level (2-tailed). Cronbach α values are reported on diagonal.

Table 6

*Descriptive Statistics for Study Measures (*n = *249)*

Measure	*M (SD)*	95% CI	Skewness	Kurtosis
LC	3.81(1.00)	[3.68, 3.93]	-.334	-.443
CE	4.00 (.79)	[3.90, 4.09]	-.330	-.554
PSE	3.89 (.63)	[3.81, 3.97]	-.231	.158
TEPE	4.44 (.52)	[4.38, 4.51]	-.766	.634
POE	3.20 (.75)	[3.11, 3.30]	-.209	.120
PC	2.46 (.90)	[2.35, 2.57]	.281	-.591
RC	3.58 (.95)	[3.46, 3.70]	-.476	-.453

Note. CI = Confidence Interval. Skewness standard error = .154. Kurtosis standard error = .307.

Statistical Assumptions

Prior to conducting data analysis, statistical assumptions of multivariate statistics were examined.. Multivariate normality, which satisfies bivariate normality requirements, was assessed using Mahalanobis distance (D^2) and chi-square (χ^2) in keeping with Burdenski (2000). Based on the Mahalanobis D^2 calculated for each variable response, values of $p < .001$ were considered extreme. Two responses were identified, ID 133 and ID 229, both $p < .001$. Both responses were removed and data were analyzed again. With removed responses, the CCA and the overall model were not significantly affected. As shown in Figures 2 and 3, scatterplots were examined and identified outliers were visible. Overall, no responses were removed as outliers, and data were determined to be multivariate normal. CCA and commonality analysis followed.

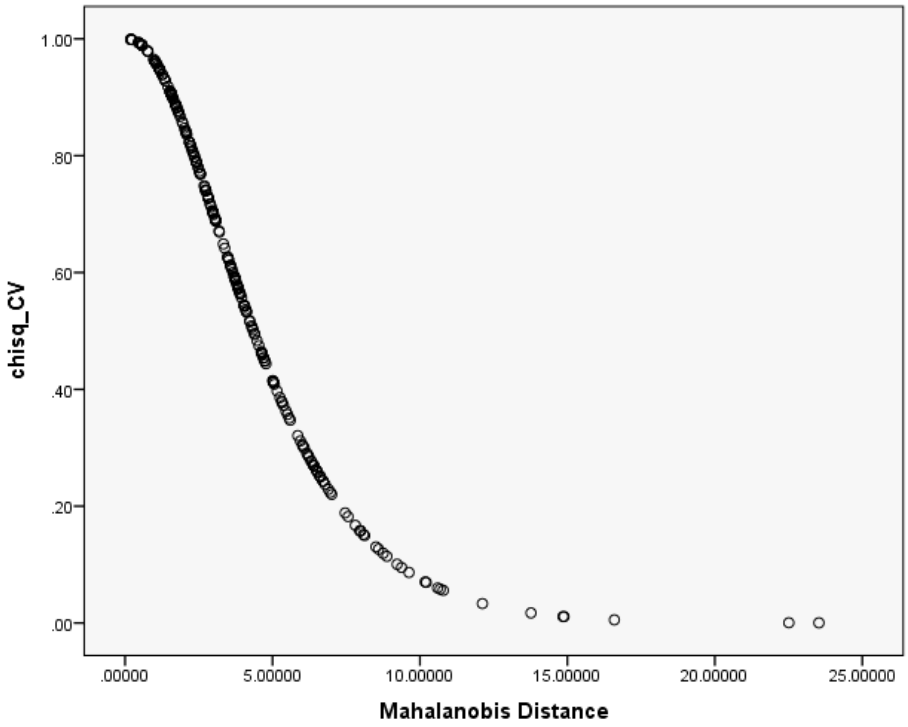

Figure 2. X^2 (chisq_CV) by Mahalanobis distance (D2) on all criterion variables.

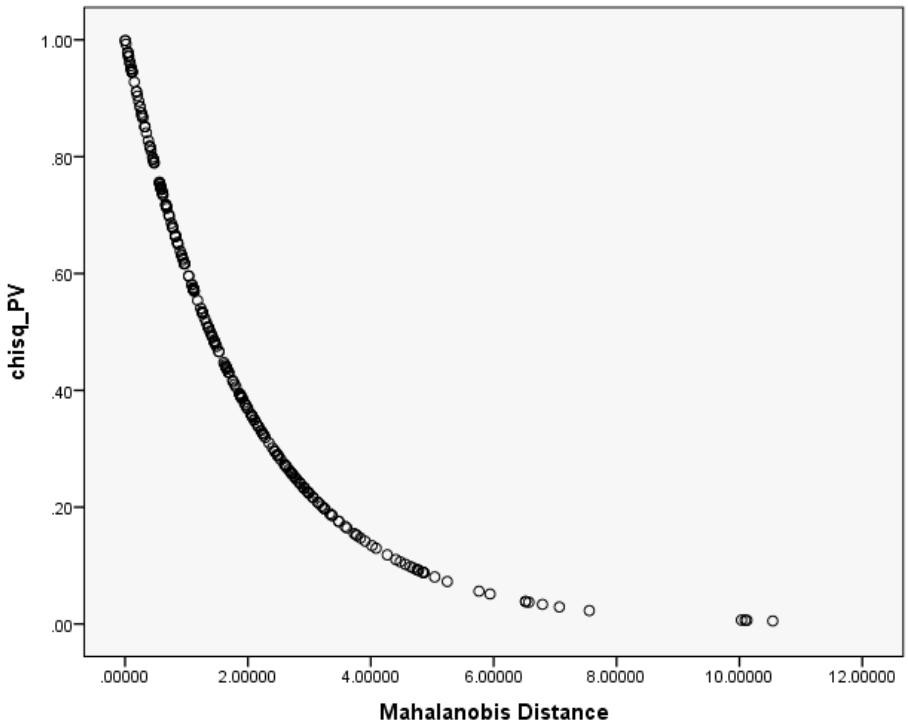

Figure 3. X^2 (chisq_CV) by Mahalanobis distance (D^2) on all predictor variables.

Data Analysis

To investigate the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change), CCA was conducted. Predictor variables (learning culture and collective efficacy) included scores from the 7-item Dimensions of Learning Organization Questionnaire (DLOQ) concise version and 12-item CE-SCALE short form for learning culture and collective efficacy, respectively. Learning transfer (criterion) variables included scores from the 15-item LTSI training in general construct scales for performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change.

Figure 4 represents the variable relationships in CCA with two predictor and five criterion variables. To evaluate the simultaneous relationship between predictor and criterion variables, CCA redistributes the variance in the original variables into pairs of canonical variates (also called synthetic, unobserved, or latent variables). Pearson r_c represents the canonical correlation between the canonical variates generated for each variable set. The canonical variates are defined by linear combinations of the two variable sets and are generated in order to maximize the correlation between the variates (Nimon et al., 2010). In this study, two functions each consisting of two canonical variates were extracted from the linear combination of the variables. As noted by Sherry and Henson (2005), there are as many canonical variates as variables in the smaller of the two variable sets.

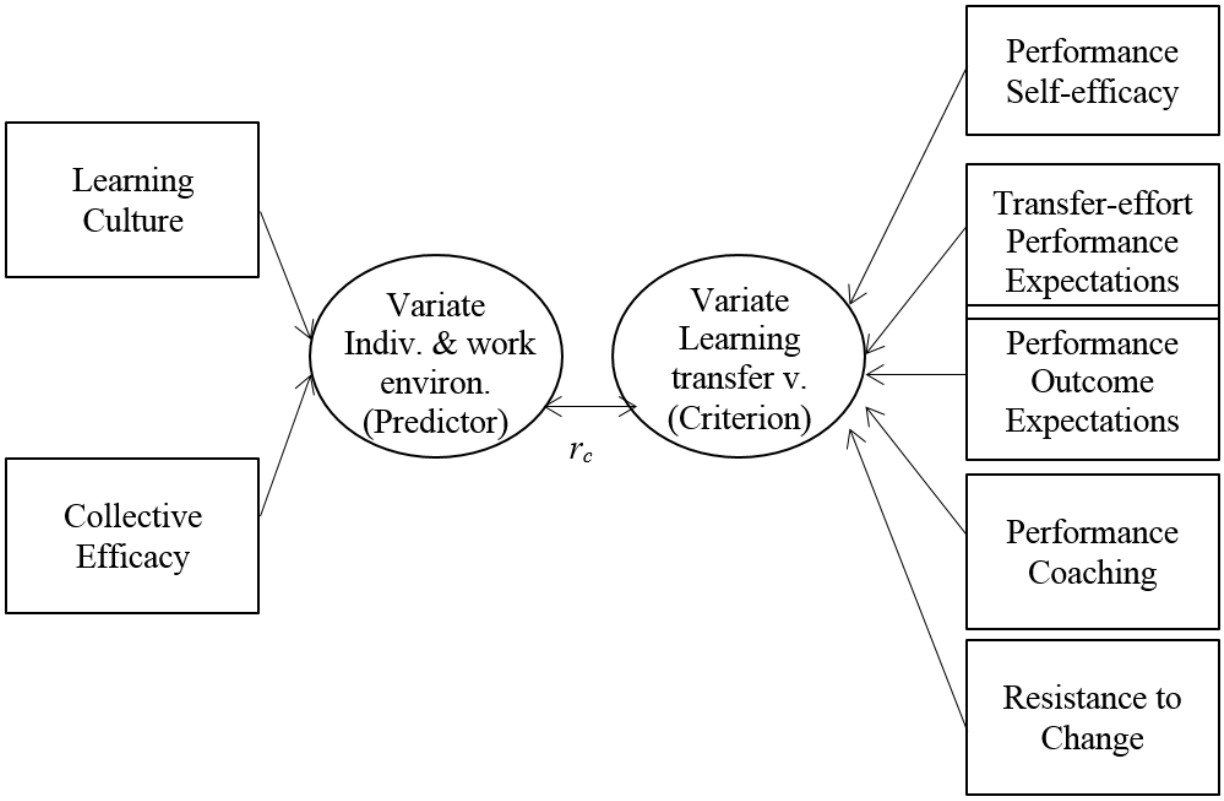

Figure 4. Research model for conducting CCA and communality analysis of individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change).

Evaluation of the Hypothesis

This study hypothesized a multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Canonical correlation analysis was conducted using two individual and work environment characteristics as predictors of the five learning transfer factors to evaluate the shared relationship between the two variable sets.

Analysis yielded two functions with squared canonical coefficient (R^2_c) of .493 and .112 for each successive function. The full canonical model across all functions was statistically and

practically significant using the Wilks's $\Lambda = .450$ criterion, $F(10, 484) = 23.723$, $p < .001$). Therefore, for the set of two canonical functions, the r^2 type effect size was .550, which indicated that the full model explained a substantial portion, 55%, of the variance shared between the variable sets.

Function 1 was statistically and practically significant, and accounted for most of the variance explained (i.e., .493 / .550 = 89.6%) and explained 49.3% of the original observed variance across the variable sets. Function 2 ($F[4, 243] = 7.769$, $p < .001$) was statistically, but not practically significant. Function 2 accounted for the least amount of the variance and explained 5.68% of the original observed variance across the variable sets.

As shown in Tables 7 and 8, results for Function 1 and Function 2 were interpreted using standardized function coefficients (β), structure coefficients (r_s), and squared structure coefficients (r_s^2), per recommendations by Sherry and Henson (2005).

Looking at Function 1, standardized function coefficients (β) revealed that LC (-.853) provided a higher contribution in the linear equation for the predictor canonical variate than CE (-.264). Similarly, the squared structure coefficients (r_s^2) revealed that LC (94.4%) shared more variance with the predictor variate than CE (41.4%).

Evaluation of standardized function coefficients (β) revealed that POE (-.623) and RC (-.546) provided the highest contribution in the linear equation for the criterion canonical variate. PSE (-.031), TEPE (-.056), and PC (-.057) made little to no contribution to the criterion canonical variate. Similarly, the squared structure coefficients (r_s^2) revealed that POE (71.9%) and RC (61.9%) shared more variance with the criterion variate than PSE (11%), TEPE (11%), and PC (.05%). Given the R_c^2 effects for each function, only the canonical results for the first function were considered for further interpretation. The remaining canonical function only

explained 5.68% of the remaining variance in the variable sets after the extraction of the prior functions.

Table 7

Canonical Analysis for Function 1

Variable	β	r_s	r_s^2	Unique	Common	Total
CE	-.264	-.644	.414	.0274	.1769	.2043
LC	-.853	-.972	.944	.2883	.1769	.4652
R^2_c		.493				
POE	-.623	-.848	.719	.1471	.2073	.3544
RC	-.546	-.787	.619	.1208	.1842	.3051
PSE	-.031	-.339	.114	.0004	.0562	.0566
TEPE	-.056	-.332	.110	.0013	.0531	.0544
PC	-.057	-.226	.051	.0015	.0237	.0252

Note. β = standardized function coefficient; r_s = structure coefficient; r_s^2 = squared structure coefficient; R^2_c = squared canonical correlation; Unique = variable's unique effect; Common = Σ variable's common effects; Total = Unique + Common.

Table 8

Canonical Analysis for Function 2

Variable	β	r_s	r_s^2	Unique	Common	Total
LC	-.719	-.236	.055	.0466	-.0403	.0063
CE	1.085	.765	.585	.1061	-.0403	.0657
R^2_c		.112				
RC	.879	.603	.363	.0715	-.0307	.0408
POE	-.694	-.487	.237	.0415	-.0148	.0267
TEPE	-.292	-.419	.175	.0079	.0118	.0197
PC	-.125	.055	.003	.0017	-.0013	.0003
PSE	.064	.044	.001	.0004	-.0002	.0002

Note. β = standardized function coefficient; r_s = structure coefficient; r_s^2 = squared structure coefficient; R^2_c = squared canonical correlation; Unique = variable's unique effect; Common = Σ variable's common effects; Total = Unique + Common.

As previously mentioned in Chapter 3, commonality analysis is used to clarify the contributions of each variable to the overall canonical effect (Nimon et al., 2010). Unique and common effects of each variable to the canonical effect are provided in Tables 9 and 10 by partitioning of each canonical variate by the other variable set for Function 1 to result in relationships among variable sets.

For Function 1, commonality analysis indicated that first- and second-order effects from learning transfer factors respectively accounted for 64% and 36% of the canonical effect (see Table 9). The largest contribution to the canonical effect was variance that was uniquely explained by LC (58.5%). Second-order effects accounted for 36% of the canonical effect that was made up of the variance that was common to LC and CE.

Commonality analysis indicated that first-, second-, third-, fourth-, and fifth-order effects from individual and work environment characteristics respectively accounted for 55%, 32%, 10%, 4%, and -.02%, respectively, of the canonical effect (see Table 10). The largest contribution to the canonical effect was variance accounted for that was unique to variance uniquely explained by POE (29.8%) and RC (24.5%). The largest second-order effect accounted for 22.5% of the canonical effect, was made up of the variance that was common to POE and RC, and was followed by a smaller contribution that was common to TEPE and POE (5%). Third-order effects contributing to the canonical effect were primarily made up of the variance common to PSE, POE, and RC (4%) and to POE, PC, and RC (3.16%). Most of the fourth-order effects accounted for less than ~ 1.0% of the canonical effect with the exception of variance that was common to PSE, TEPE, POE, and RC (3.6%). Finally, fifth-order effects only accounted for -.02% of the canonical effect that was common to all five learning transfer factors.

Table 9

Partitioning of Learning Transfer Factors (Criterion) Canonical Variate

Components	Coefficient	% Total
Unique to LC	.2883	58.52
Unique to CE	.0274	5.57
Common to LC and CE	.1769	35.90
Total	.4927	100.00

Table 10

Partitioning of Individual and Work Characteristic (Predictor) Canonical Variate

Components	Coefficient	% Total
Unique to PSE	.0004	0.08
Unique to TEPE	.0013	0.26
Unique to POE	.1471	29.85
Unique to PC	.0015	0.31
Unique to RC	.1208	24.53
Common to PSE TEPE	.0005	0.09
Common to PSE POE	.0024	0.48
Common to TEPE POE	.0247	5.01
Common to PSE PC	-.0001	-0.02
Common to TEPE PC	-.0002	-0.04
Common to POE PC	.0047	0.95
Common to PSE RC	.0087	1.77
Common to TEPE RC	-.0010	-0.21
Common to POE RC	.1108	22.49
Common to PC RC	.0063	1.27

(table continues)

(continues).

Components	Coefficient	% Total
Common to PSE TEPE POE	.0069	1.40
Common to PSE TEPE PC	-.0001	-0.01
Common to PSE POE PC	-.0003	-0.05
Common to TEPE POE PC	-.0008	-0.16
Common to PSE TEPE RC	.0007	0.15
Common to PSE POE RC	.0199	4.05
Common to TEP POE RC	.0065	1.33
Common to PSE PC RC	-.0003	-0.06
Common to TEPE PC RC	.0000	0.00
Common to POE PC RC	.0155	3.16
Common to PSE TEPE POE PC	-.0004	-0.08
Common to PSE TEPE POE RC	.0177	3.60
Common to PSE TEPE PC RC	-.0003	-0.06
Common to PSE POE PC RC	.0007	0.14
Common to TEPE POE PC RC	-.0011	-0.22
Common to PSE TEPE POE PC RC	-.0001	-0.02
Total	.4927	100.00

Summary

Chapter 4 included the results of this study. Data assessment, data analysis, and evaluation of hypothesis of this study were described in detail. Chapter 5 presents a discussion of findings, recommendations for future research, and implications for practice.

CHAPTER 5

FINDINGS, RECOMMENDATIONS, AND IMPLICATIONS

Results from this study were described in the previous chapter. This chapter includes discussion of findings and recommendations for future research. Finally, this section provides implications for practice. The implications for practice include applications of the findings considered relevant to a school learning culture and collective efficacy, as well as opportunities for considering variables influencing the transfer of knowledge, skills, and dispositions acquired in professional learning.

Discussion of Findings

The purpose of this study was to assess the multivariate relationship between individual and work environment characteristics (learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Findings from this study indicated, for this population, the presence of a relationship between individual and work environment characteristics and learning transfer factors. The five observed learning transfer factors represented Learning Transfer System Inventory (LTSI) training in general constructs. Bates et al. (2012) identified these constructs as individual and contextual factors affecting learning transfer.

Demographic data represented a less diverse sample than anticipated. Of particular interest was the percentage of White (85.1%) females (89.2%) with a master's degree (71.9%). In terms of years of experience, a considerable percentage of the sample had 11 or more years of teaching experience (collectively 79.2%) and held a primary position as teacher leader or coach (43%) or regular or general education teacher (30.9%). Additionally, school representation was

particularly low for the participants working at the middle school level (18.1%), in a charter school setting (4%), and with a student enrollment between 1,000 and 1,500 and 1,500 and 2,000 (8.8%, respectively). While demographics were not available for the population, the sample did not mimic the overall membership profile and characteristics available for Learning Forward and relevant to this study (e.g., school staff predominantly at large schools at the middle and high school level with high percentages of African Americans and Asians located in the suburbs). Overall, however, demographic characteristics of the sample were similar to the 2011 data from the National Center for Education Statistics (2012), which indicated that the 3.7 million full-time elementary and secondary school teachers were White (83%) females (76%) with a master's degree (52%). Nevertheless, the sample in no way resembled the composition of all school based instructional staff in the United States or broad. Therefore, the results of this study offer limited generalizability.

Some noteworthy patterns surfaced from descriptive statistics, and correlation analysis. First, correlations between learning culture (LC) and all other variables were positive and both statistically and practically significant except performance coaching (PC) and performance self-efficacy (PSE). This finding suggests that school-based instructional staff perceived relatively little support for transfer and performance efficacy beliefs (despite rating the learning culture relatively high). Second, collective efficacy (CE) correlations were only found to be positive and statistically and practically significant among learning culture (LC), performance outcome expectations (POE), and resistance to change (RC) variables. This finding implies that school-based instructional staff perceived their schools to represent a learning culture with a positive norm toward change (e.g., RC) and held strong outcome-related expectations (e.g., POE). Third, negative correlations were found between performance coaching (PC) and transfer-effort

performance expectations (TEPE). Instructional school-based staff perceived high effort devoted to transferring learning that will lead to changes in performance (i.e., TEPE) but could include low support for transfer (i.e., PC). This finding suggests that when staff devote effort to transferring learning into their daily work with the understanding that such effort will lead to changes in job performance there is little support for transferring learning, including less constructive feedback, input, and assistance (e.g., performance coaching). While these were initial findings, results were further clarified using canonical correlation analysis.

Canonical correlation analysis (CCA) was conducted using the two individual and work environment characteristics (learning culture and collective efficacy) as predictors of the five learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change). Analyses of these variables were used to address the hypothesis for this study. Overall, learning culture (LC) and collective efficacy (CE) demonstrated a relationship to resistance to change (RC), performance outcome expectations (POE). Learning culture and collective efficacy, however, showed little relationship with the criterion variables of transfer-effort performance expectation (TEPE), performance coaching (PC), and performance self-efficacy (PSE). Although valuable, findings were further clarified as a result of commonality analysis.

Commonality analysis provided a clearer picture of results by identifying unique and common contributions of each variable. A few substantive results occurred. First, with regard to the unique effects of the two individual and work environment characteristics on learning transfer factors, learning culture made the largest unique contribution to the canonical effect. Specifically, learning culture (LC) had the largest effect on learning transfer factors performance-outcome expectations (POE) and resistance to change (RC). These findings

coincided with Egan et al.'s (2004) finding that a learning culture has a significantly positive effect on motivation to transfer. Similarly, Choi and Ruona (2011) asserted that a learning culture in which individuals are more likely to exhibit higher levels of readiness to change focuses on the micro-level perspective of change (i.e., RC) and places a greater emphasis on individuals implementing the change (Hall & Hord, 2011). A learning culture recognizes the need to make explicit the valued outcomes (i.e., POE) likely to result from transferring learning back to the workplace (Holton, Bates, Bookter, & Yamkovenko, 2007).

Additionally, a school's learning culture is inclusive of many dimensions, as defined by Marsick and Watkins (1993, 1996), and creates continuous learning opportunities, promotes dialogue and inquiry, promotes collaboration and team/group learning, empowers people to evolve a collective vision, establishes systems to capture and share learning, connects the organization to its environment, and provides strategic leadership for learning. These elements of the culture each work to foster a positive rather than negative norm for change (Fullan, 2001), which Hall and Loucks (1979) found in their seminal study on teacher perceptions of change. Findings by Hall and Loucks are widely accepted as a model for understanding the change process and its influence on implementation, or transfer of learning (Hall & Hord, 2011). Similarly, Velada and Caetano (2007) noted the important role efficacy beliefs play in learning transfer.

Second, with regard to common effects of the two individual and work environment characteristics on learning transfer factors, learning culture and collective efficacy together made a large contribution to learning transfer factors. This finding is not surprising, because culture has been identified as one of the "most powerful forces operating in organizations" (Schein, 1997, p. 231). Additionally, Goddard (2001) proposed that perceived collective efficacy was an

important aspect of school culture and the influence of normative expectations. Essentially, staff beliefs about their teams or schools are influenced by their cultures. As a construct derived from social cognitive theory, collective efficacy is based on the assumption that individuals' behavior and motivation are highly influenced by the strength of their efficacy beliefs (Bandura, 1993). As such, Goddard and Goddard (2001) found that the staff members who believe in the school's capabilities to implement change may be compelled by expectations for successful teaching and empowerment, and these may indeed be aspects of organizational culture that build collective efficacy. Therefore, the findings suggest that these expectations (e.g., performance self-efficacy) influence staff members' efforts to transfer learning and reduce resistance to change.

Third, with regard to common effects of the five learning transfer factors on individual and work environment characteristics, performance outcome expectations and resistance to change together made a large contribution to learning culture and collective efficacy. This observation suggests that expectations for change in practice lead to valued outcomes when individual perceptions about how others will view changes, how much energy they will invest, and how much support they will receive are positively affected (Baldwin & Ford, 1988; Noe, 1986).

Fourth, performance outcome expectations and transfer-effort performance expectations together made a small, yet noteworthy, contribution to learning culture and collective efficacy. This finding indicates when staff members understand both the valuable outcomes (e.g., POE) and changes in performance (e.g., TEPE), they are more motivated to put forth the effort to transferring learning when they feel they can help students learn (Salas & Cannon-Bowers, 2001; Vroom, 1964).

Fifth, performance-self-efficacy, performance outcome expectations, and resistance to change together made a small, but noteworthy, contribution to learning culture and collective efficacy. This finding implies that individual self-efficacy is related to a learning culture and collective efficacy when staff members have an understanding of valued outcomes resulting from their efforts and when an openness to change is present (Goddard et al., 2000; Guskey, 1988).

Finally, a noteworthy, yet unexpected, finding emerged. It would not be unrealistic to infer that a school characterized by a learning culture whose staff held positive judgments of staff capabilities (e.g., collective efficacy) would provide support for implementation, constructive feedback, input, assistance (e.g., performance coaching), and performance related efficacy beliefs (e.g., performance self-efficacy). However, when examining learning transfer factors least influenced by learning culture and collective efficacy, the results provided a different scenario. This finding suggests that despite perceptions of a collectively efficacious school learning culture, instructional school-based staff perceive relatively low support for transfer, including feedback, input, and assistance (e.g., performance coaching); low beliefs about their own capabilities (e.g., performance self-efficacy); and low beliefs that effort devoted to changing knowledge, skills, dispositions, and practices acquired in professional learning lead to improved job performance (e.g., transfer-effort performance outcome).

Although initially surprising, Baldwin and Ford (1998) and Hall and Hord (2011) acknowledged that learning activities alone might be inadequate to support the transfer of learning. Likewise, Lim and Johnson (2002) reported that a supportive work climate could be the single most important factor for the successful transfer of learning. Despite the learning culture and staffs' belief in the schools' capabilities, the climate to which staff return is essential to transferring new learning acquired in professional learning opportunities. Thus, low

perceptions of support and individual capabilities to apply new learning and overcome obstacles that hinder the use of new learning would not be unrealistic. Further, Kellett et al. (2009) proposed that some situations might lead to collective efficacy being more important than self-efficacy. Consistent with the literature on sources of efficacy beliefs (Gist et al., 1991), efficacy is influenced by past success (e.g., mastery experiences), collaboration and observation (e.g., vicarious experiences), and feedback and encouragement (e.g., social persuasion). All of three of these factors are essential to learning transfer and to performance self-efficacy, perceptions of support, and recognition of the benefits of changing practice or job performance. The finding however, refuted Goddard and Goddard (2001) and Zellars et al. (2001) who promoted collective efficacy as positively related to self-efficacy.

Additionally, the sample included a large majority of experienced teachers, teacher leaders, and coaches which could have led to this finding. A secondary conclusion involves instructional school-based staff members with experience and/or holding roles beyond the classroom teacher perceiving relatively little support for transfer and holding low confidence in their capabilities and beliefs to implement new learning and to improve their performance (even with high perceptions of learning culture and collective efficacy). Support for learning transfer may be limited, and all individuals in the school do not receive the same level of support. Consequently, even a learning culture that attends to dimensions of learning at all levels (individual, team or group, and organizational) may not provide adequate support for the transfer of such learning back to the workplace once knowledge is acquired.

Recommendations for Future Research

Several areas of additional research are warranted considering the results of this study. Future researchers are encouraged to consider these suggestions as opportunities to add to the

body of knowledge regarding learning cultures, collective efficacy, and learning transfer. These recommendations focus on changes to the population, instruments, research analysis, and research design.

Population

This study focused on school-based instructional staff members who were current members of an education professional association. Several aspects of the population have challenged generalizability. The first recommendation would involve modifying the study population. Demographic membership information for the population was not available and would have allowed for a more representative sample. Additionally, available information was limited to name, email, and position, and email addresses and positions were not always designated. This lack of information generated difficulty for identifying the sample from the full membership roster. If the study is replicated, it may be advantageous to over sample and to identify the entire membership as the population. Next, researchers should consider using for participation an alternate source other than using a professional association's database. Finally, limiting the study to single states or specified regional area may provide clearer comparison of schools, teams, and teachers.

Instrument

Condensed versions of all variables' instruments to reduce the number of instrument items on the survey. However, future researchers are encouraged to use the full versions of the Dimensions of Learning Organization Questionnaire (DLOQ) and LTSI to increase the amount of information available to researchers about these to multidimensional constructs. Specially, the role of leadership, as well as hierarchical dimensions (individual, team or group, and

organizational) of a learning organization and learning and transfer as defined by each of the constructs, could be more appropriately addressed.

Additionally, this study focused on individual perceptions of collective efficacy and individual outcomes. Most collective efficacy research addresses school-level outcomes (Zellars et al., 2001). While future researchers should continue to examine individual-level perceptions of collective efficacy on individual outcomes, research on the effects of school-level perceptions of collective efficacy representing the average of staff scores could provide additional support for collective efficacy and learning transfer factors.

Research Design

Data were not controlled for school environment characteristics. Future research could include controlling for school enrollment, size, region, and setting. Also, inclusion of student achievement and other school-based demographics could lead to more revealing results. Additionally, due to the nested nature of the data collected, analyzing data using hierarchical linear modeling would be advantageous to provide a more precise interpretation of the data based on team, school, and/or district type (Stevens, 2009).

Implications for Practice

With regard to contributions, this study examined the link between individual and work environment characteristics and learning transfer factors that are important constructs of school improvement research. The following three principles stem from the findings. All together, consideration of these implications may be essential for education leaders, as well as for all individuals responsible for planning, implementing, and evaluating professional learning, seeking to understand the conditions for supporting and inhibiting the implementation, or transfer, of the knowledge, skills, dispositions, and practices acquired in professional learning.

Recognize that a Collectively Efficacious Learning School Culture Maximizes Efforts

A school characterized by a learning culture with a strong sense of collective efficacy significantly influences learning transfer. Subsequently, a collectively efficacious learning school culture is better than a learning culture alone. Without both, schools may not fully support or sustain the transfer of new learning acquired in professional learning within daily work. While a learning culture has long been identified as an organizational factor essential to individual and school performance, collective efficacy is a key school factor that is widely ignored. Collective efficacy manifests itself in the organizational norms that suggest *what* people should do and *how* they should go about accomplishing tasks and goals.

Therefore, I recommend that the time taken to develop a culture of learning must be equal to the time taken to develop teachers' understanding of what effective teaching resembles in practice. A culture of learning allows them to observe others' practice to deepen their understanding. To achieve this end, all educators need to experience high levels of professional learning inclusive of appropriate learning experiences likely to achieve intended outcomes and promote implementation, and to be enabled to better sever students and increase their overall effectiveness. Second, the elements of collaborative inquiry and learning that promote time for job-embedded learning and observation, opportunities for encouragement and celebrating successes, and clear and frequent feedback from multiple sources need to be examined. Third, educational leaders must build a culture of mutual respect and trustworthiness that promotes shared personal practice. By doing so, teachers' perceptions of the beliefs and expectations of success would be increased, the collective efficacy of the school would be strengthened, and learning at all levels would be maximized.

Ensure Potential Outcomes and Changes in Performance are Explicit

Collectively efficacious learning school cultures make explicit through ongoing communication and dialogue the value, need, importance, benefits, and relevance not only of learning but also, and more importantly, implementing change and transferring new knowledge, skills, and practices acquired from professional learning. Most importantly, the collectively efficacious learning school cultures create a positive norm for change. A school with an environment that is open rather than resistant to change while also communicating the vision for both valued outcomes and specific changes in job performance will influence transfer learning acquired in professional learning back to daily work.

Therefore, I recommend that an ongoing dialogue about student and educator goals, outcomes, and alignment, along with structures, processes, and systems essential to support and sustain implementation, occur regularly among all educators. With that end in mind, I recommend engaging educators in ongoing high quality, relevant professional learning based on data and evidence collected through practice. Second, I suggest promoting a shared understanding of the vision and clear goals for effective teaching and learning in order to facilitate the entire learning community together sharing diverse perspectives. Finally, education leaders must implement change based on micro-level perspectives rather than solely on systems-level thinking. By using macro-level perspectives, focus on individual changes in practice and job performance and increased motivation and commitment to devote the necessary effort to desired outcomes can be maintained. Thus, staff members' dispositions toward change are greatly influenced by the school's learning culture and by beliefs in the school's capabilities. A positive disposition influences the degree of energy invested in changing practice and expecting that adequate and appropriate support for implementation will follow. Consequently, support for

transfer (e.g., performance coaching) is an expectation that influences the willingness to be open to change, and staff are less likely to transfer learning back into climates that fail to support the use of the new skills.

Foster a Climate Conducive to Both Learning and Implementation

A learning culture promotes learning, but a transfer climate promotes implementation, or transfer, of learning back to the workplace. Hence, when teachers are met with minimal support for implementation and change following professional learning, intended outcomes and changes in job performance may not be actualized. For professional learning to impact changes in teacher practice that then influence student success, new knowledge, skills, dispositions, and practices acquired in professional learning must be successfully implemented, or transferred, with fidelity in order to be sustained overtime.

While a collectively efficacious learning school culture plays a pivotal role in the learning transfer process, it is insufficient to bring about support for transfer (e.g., performance coaching) back to the workplace. Change in educator practice occurs when professional learning is sustained and supported over time. Therefore, support for implementation requires recognition and application of research on the change process. Conscious, deliberate, and intentional planning can provide the necessary conditions for implementing change including time and human resources. It is, however, a learning transfer climate that has the potential to support implementation. Support that is provided at all levels (individual, team, and school wide) is inclusive of time for collaboration, use of data to identify challenges and monitor progress, opportunities for coaching, feedback, reflection, and recommendations for adjustments. A positive transfer climate provides situational cues that influence perceptions of professional learning. A lack of support for transfer of learning including lack of construct feedback, input,

and assistance (i.e., performance coaching); beliefs in one's capabilities to transfer learning (i.e., performance self-efficacy; beliefs that new learning acquired will improve practice and performance; and transfer-performance outcome expectations may contribute to the inability to fully realize changes in practice and subsequent performance outcomes. Therefore, education leaders should not dismiss the individual and contextual factors affecting the transfer of learning.

Educators are encouraged to foster a deeper understanding of change research in order to commit to long-term change and to influence subsequent decisions surrounding any new implementation effort. Resources necessary to sustain implementation efforts, including human, fiscal, material, technology, and time, need realignment (Learning Forward, 2011). Education leaders need to seek new ways to articulate the link between professional learning and student results to influence efforts devoted to implementation and efficacy judgments about perceived capabilities. A positive transfer climate could also include greater efforts to recognize professional learning as a complex and multidimensional system that promotes learning and transfer within the workplace. Subsequently, education leaders and those with responsibility to plan, implement, and evaluate professional learning must recognize that ongoing support, feedback, and input (i.e., performance coaching) for implementation is necessary across all levels (individual, team, and organizational), positions, or roles (e.g., teacher, coach, and principal) as well as among diverse years of experience (novice, mid-career, and veteran). Thus, it is essential that all educators engage in continuous learning to serve students more effectively throughout their careers and to increase individual effectiveness, improve schools, and increase student outcomes.

Summary

A multivariate relationship between individual and work environment characteristics

(learning culture and collective efficacy) and learning transfer factors (performance self-efficacy, transfer-effort performance expectations, performance outcome expectations, performance coaching, and resistance to change) was found in this study. Interactions between individual and work environment characteristics and learning transfer factors indicate that learning culture and collective efficacy together demonstrates a relationship to a school's positive norm for change and staff outcome and performance expectations. Finally, learning culture and collective efficacy do not relate to support for transfer (e.g., performance coaching), individual beliefs in their capabilities (e.g., performance self-efficacy), and beliefs about the extent to which new knowledge and skills acquired in professional learning change practice and improve job performance (e.g., transfer-effort performance expectation).

APPENDIX A

PARTICIPANT CORESPONDENCE

Prenotification Email

RE: Please provide your feedback

I am writing to request your help with a very important research project.

My name is Jacqueline Kennedy. I am conducting my doctoral research at the University of North Texas. I am writing today to invite you to participate in a brief online survey as part of my research study about the implementation of professional learning.

In a couple of days, you will receive an email with a link to an electronic survey. I would very much appreciate the contribution of your unique perspective and experience to this research.

This study is expected to help education leaders better understand conditions supporting and inhibiting the implementation of professional development. With this information, we hope to contribute to the field of teacher education, teacher development, and school improvement.

As a way of thanking you for your help, you may enter elect to enter a drawing at the conclusion of the survey to win one Amazon 16GB HD Kindle Fire or one of ten $10 Amazon gift cards. Winners were drawn at random on April 5, 2013.

Sincerely,

Jacqueline Kennedy
Doctoral Candidate
Department of Learning Technologies
University of North Texas
JacquelineKennedy@my.unt.edu

Dr. Kim Nimon
Assistant Professor
Department of Learning Technologies
University of North Texas
Kim.Nimon@unt.edu

Invitation Email with Link

RE: Join other educators; provide your feedback and enter a drawing for a Kindle Fire

Last week you may have received an email message about participating in a survey on implementation of professional learning.

You have been chosen to complete this survey because of your position as a school-based instructional staff member. Your responses are important, and may help education leaders better understand conditions supporting and inhibiting the implementation of professional learning. At the end of the survey, you may request a brief description of final results.

I would very much appreciate the contribution of your unique perspective and experience to this research. The survey takes no more than 10-15 minutes to complete and your responses are completely anonymous. I know how busy everyone is at this time of year, but if you choose to participate, please submit your responses by Friday March 15, 2013.

The Office of Human Research Institutional Review Board (IRB) approves this research (IRB #13-081). To our knowledge, there is no risk to your participation in this questionnaire, and your participation is voluntary.

To take the survey, please go to: https://unt.qualtrics.com/SE/?SID=SV_5vF45U6gEUZDYTH

(Please copy and paste this address on your browser if it does not automatically take you to the link).

Thank you very much for your time and contribution to this research study. As a way of thanking you for your help, at the conclusion of the survey you may enter a drawing to win one Amazon 16GB HD Kindle Fire or one of ten $10 Amazon gift cards. Winners will be drawn at random on April 5, 2013.

Sincerely,

Jacqueline Kennedy
Doctoral Candidate
Department of Learning Technologies
University of North Texas
JacquelineKennedy@my.unt.edu

Dr. Kim Nimon
Assistant Professor
Department of Learning Technologies
University of North Texas
Kim.Nimon@unt.edu

Reminder Email

RE: Last opportunity to provide your feedback by March 15

About a week ago, you received an email from Jacqueline Kennedy requesting your participation in a very important research study that involves the implementation of professional learning. If you have not yet had a chance to complete the survey, please do so by clicking on this link:

https://unt.qualtrics.com/SE/?SID=SV_5vF45U6gEUZDYTH

(Please copy and paste this address on your browser if it does not automatically take you to the link).

We request that you submit your responses by Friday March 15, 2013.

Thank you very much for your time and contribution to this research study. As a way of thanking you for your help, at the conclusion of the survey you may enter a drawing to win one Amazon 16GB HD Kindle Fire or one of ten $10 Amazon gift cards. Winners will be drawn at random on April 5, 2013.

Sincerely,

Jacqueline Kennedy
Doctoral Candidate
Department of Learning Technologies
University of North Texas
JacquelineKennedy@my.unt.edu
Dr. Kim Nimon
Assistant Professor
Department of Learning Technologies
University of North Texas
Kim.Nimon@unt.edu

APPENDIX B

PERMISSIONS

Permission for LTSI Transfer in General Construct Scales

From: Reid A Bates
To: Jacqueline Kennedy
Sent: Monday, September 24, 2012 3:59 PM
Subject: RE: Permission to use the LTSI for doctoral dissertation

Thanks, Jacqueline. Please find attached version 4 of the LTSI. If possible, it would be helpful to us if you can also collect the demographic data on the final pages. I am also attaching a manuscript that has recently been accepted for publication in Human Resource Development International describing the analysis and validation leading to version 4. It should be out in print in the November issue.

Please let me know if there is anything else you need. – Reid

Permission for CE-SCALE Short Form

From: Roger Goddard
To: Jacqueline Kennedy
Sent: Friday, September 14, 2012 2:15 PM
Subject: Re: Permission to use the CE-Scale for doctoral dissertation

Dear Jacqueline:

All that you outline below is fine. You may use the instrument for your work. Good luck with your study.

Roger

Permission for DLOQ concise version

From: Karen Watkins
To: Jacqueline Kennedy
Cc: Victoria Marsick; Judy O'Neill
Sent: Friday, September 14, 2012 2:39 PM
Subject: Re: Permission to use the DLOQ for doctoral dissertation

We are delighted to grant you permission under these terms.

Best wishes to you in your study.

Karen

Permission for Learning Forward Member Database

From: Stephanie Hirsh
To: Jacqueline Kennedy
Sent: Friday, February 1, 2013 7:20 AM
Subject: Doctoral Study Permission

Learning Forward grants permission to Jacqueline Kennedy to use the member database as part of her doctoral research. We understand the parameters that are in place.

Stephanie Hirsh, Executive Director, Learning Forward

Permission to Reproduce Transfer Process Model

JOHN WILEY AND SONS LICENSE TERMS AND CONDITIONS

Feb 19, 2013

This is a License Agreement between Jacqueline E Kennedy ("You") and John Wiley and Sons ("John Wiley and Sons") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by John Wiley and Sons, and the payment terms and conditions.

All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.

License Number	3092711355393
License date	Feb 19, 2013
Licensed content publisher	John Wiley and Sons
Licensed content publication	Personnel Psychology
Licensed content title	TRANSFER OF TRAINING: A REVIEW AND DIRECTIONS FOR FUTURE RESEARCH
Licensed copyright line	Copyright © 2006, John Wiley and Sons
Licensed content author	TIMOTHY T. BALDWIN,J. KEVIN FORD
Licensed content date	Dec 7, 2006
Start page	63
End page	105
Type of use	Dissertation/Thesis
Requestor type	University/Academic
Format	Print and electronic
Portion	Figure/table
Number of figures/tables	1
Original Wiley figure/table number(s)	Figure 1: Transfer Process Model (p. 65)
Will you be translating?	No
Total	0.00 USD

REFERENCES

Allison, P. D. (2002). Missing data: Quantitative applications in the social sciences. *British Journal of Mathematical and Statistical Psychology*, *55*(1), 193-196.

American Educational Research Association. (2006). Standards for reporting on empirical social science research in AERA publications. *Educational Research, 35,* 33-40.

American Psychological Association. (2009a). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

American Psychological Association. (2009b). *Publication manual of the American Psychological Association: Supplemental material: Writing clearly and concisely*. Available at: http://supp.apa.org/ style/pubman-ch03.00.pdf

Andrews, D., Nonnecke, B., & Preece, J. (2003). Electronic survey methodology: A case study in reaching hard-to-involve Internet users. *International Journal of Human-Computer Interaction*, *16*(2), 185-210.

Argyris, C., & Schön, D. (1996). *Organizational learning II: Theory, method, and practice.* Reading, MA: Addison Wesley.

Argyris, C., & Schon, D. (1978) *Organizational learning: A theory of action perspective*. Reading, MA: Addison Wesley.

Baldwin, T. T., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, *41*(1), 63-105. doi:10.1111/j.1744-6570.1988.tb00632.x

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Upper Saddle River, NJ: Prentice Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*, 117-148.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bates, R., & Holton, E. F., III. (1995). Computerized work performance monitoring: A review of human resource issues. *Human Resource Management Review, 5,* 267-288.

Bates, R., & Holton, E. F., III. (2004). Linking workplace literacy skills and transfer system perceptions. *Human Resource Development Quarterly*, *15*(2), 153-170.

Bates, R., Holton, E. F., III, & Hatala, J. P. (2012) A revised Learning Transfer Systems Inventory (LTSI): Factorial replication and validation. *Human Resource Development Quarterly*, *1,* 1-21. doi:10.1080/13678868.2012.726872

Bates, R., & Khasawneh, S. (2005). Learning culture, learning transfer climate and perceived innovation in Jordanian organizations. *International Journal of Training and Development, 9*(2), 96-109.

Blume, B., Ford, J. K., Baldwin, T., & Huang, J. (2010). Transfer of training: A meta-analytic review. *Journal of Management, 36*(4), 1065-1105.

Boreham, N., & Morgan, C. (2004). A sociocultural analysis of organizational learning. *Oxford Review of Education, 30*(3), 307-325.

Borko, H. (2008). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(8), 3-15.

Budworth, M. (2011). Individual learning and group performance: The role of collective efficacy. *Journal of Workplace Learning, 23,* 391-401.

Burdenski, T. (2000). Evaluating univariate, bivariate, and multivariate normality using graphical and statistical procedures. *Multiple Linear Regression Viewpoints*, *26*(2), 15-28.

Carifio, J., & Perla, R. (2008). Resolving the 50-year debate around using and misusing Likert scales. *Medical Education, 42,* 1150-1152.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *56*(2), 81.

Cho, H., & LaRose, R. (1999). Privacy issues in Internet surveys. *Social Science Computer Review, 17,* 421-434.

Choi, M., & Ruona, W. (2011). Individual readiness for organizational change and its implications for human resource and organization development. *Human Resource Development Review, 10*(1), 46-73.

Clarke, N. (2002). Job/work environment factors influencing training effectiveness within a human service agency: Some indicative support for Baldwin and Fords' transfer climate construct. *International Journal of Training and Development, 6*(3), 146-162.

Clarke, D. J., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth *Teaching and Teacher Education, 18*(8), 947-967.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.

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

Colquitt, J. A., LePine, J. A., & Noe, R. (2000). Toward an integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology, 85,* 678-707.

Coppieters, P. (2005). Turning schools into learning organizations. *European Journal of Teacher Education, 28*(2), 129-139.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 6,* 297-334.

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan, 76*(8), 597-604.

Desimone, L. (2009). How can we best measure teacher's professional development and its effects on teachers and students? *Educational Researcher, 38*(3), 181-199.

Deutskens, E., De Ruyter, K., Wetzels, M., & Oosterveld, P. (2004). Response rate and response quality of internet-based surveys: An experimental study. *Marketing Letters, 15*(1), 21-36.

Desimone, L., Porter, A., Garet, M., Yoon, K. S., & Birman, B. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis, 24*(81), 81-112.

Dillman, D. A. (2000). *Mail and web-based survey: The tailored design method.* New York, NY: Wiley.

Eysenbach, G., & Wyatt, J. (2002). Using the Internet for surveys and health research. *Journal of Medical Internet Research, 4*(2). Retrieved from http://www.jmir.org/2002/2/e13/

Facteau, J. D., Dobbins, G. H., Russell, J. E. A., Ladd, R. T., & Kudisch, J. D. (1995). The influence of general perceptions of the training environment on pretraining motivation and perceived training transfer, *Journal of Management, 21*(1), 1-25.

Fielding, M. (1997). Beyond school effectiveness and school improvement: Lighting the slow fuse of possibility, *Curriculum Journal, 8*(1), 7-27.

Foley, L. S. (2011). Exploring K-3 teachers' implementation of comprehension strategy instruction (CSI) using expectancy-value theory. *Literacy Research and Instruction, 50*(3), 195-215.

Ford, J. K., Smith, E. M., Weissbein, D. A., Gully, S. M., & Salas, E. (1998). Relationships of goal orientation, metacognitive activity, and practice strategies with learning outcomes and transfer. *Journal of Applied Psychology, 83*(2), 218.

Fullan, M. (2001). *The new meaning of educational change* (3rd ed.). New York, NY: Teachers College Press.

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: An introduction* (7th ed.).

Boston, MA: Allyn and Bacon.

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.

Garvin, D. (1993). Building learning organizations. *Harvard Business Review, 71*(4), 78-91.

Geer, C. H., & Morrison J. Q. (2008). The impact of the collective efficacy of a school community on individual professional development outcomes. *Mid-Western Educational Researcher, 21*(4), 32-38.

Gist, M. E., Stevens, C. K., & Bavetta, A. G. (1991). Effects of self efficacy and post training intervention on the acquisition and maintenance of complex interpersonal skills. *Personnel Psychology, 44*(4), 837-861.

Gibson, C. B. (2001). Me and us: Differential relationships among goal setting training, efficacy, and effectiveness at the individual and team level. *Journal of Organizational Behavior, 22*(7), 789-808.

Goddard, R. D. (2001). Collective efficacy: A neglected construct in the study of schools and student achievement. *Journal of Educational Psychology, 93*(3), 467-476.

Goddard, R.D. (2002). A theoretical and empirical analysis of the measurement of collective efficacy: The development of a short form. *Educational and Psychological Measurement, 93*, 467-476.

Goddard, R. D. & Goddard, Y. L. (2001). A multilevel analysis of the influence of collective efficacy on teacher efficacy. *Teaching and Teacher Education, 17,* 807-818.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2000). Collective teacher efficacy: Its meaning, measure, and impact on student achievement. *American Educational Research Journal, 37*(2), 479-507.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2004). Collective efficacy beliefs: Theoretical developments, empirical evidence, and future directions. *Educational Researcher, 33*(3), 3-13.

Goddard, R. D., Logerfo, L., & Hoy, W. K. (2004). High school accountability: The role of perceived collective efficacy. *Educational Policy, 8*(3), 403-425.

Goldstein, H., & Woodhouse, G. (2000). School effectiveness research and educational policy. *Oxford Review of Education, 26*(3-4), 353-363.

Grossman, R., & Salas, E. (2011). The transfer of training: What really matters. *International Journal of Training and Development, 15*, 103-120.

Gully, S. M., Incalcaterra, K. A., Joshi, A., & Beaubien, J. M. (2002). A meta-analysis of team

efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology, 87*, 819-832.

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice, 8*(3/4), 381-391.

Guskey, T. R. (1988). Teacher efficacy, self-concept, and attitudes towards the implementation of instructional innovation. *Teaching and Teacher Education,* 4(1), 63-69.

Hall, G., & Hord, S. (2011). *Implementing change: Patterns, principles, and potholes* (3rd ed.). Boston, MA: Allyn and Bacon.

Hall, G., & Loucks, S. (1979). *Implementing innovations in schools: A concerns-based approach.* Austin, TX: Research and Development Center for Teacher Education, University of Texas.

Hargreaves, A. (2009). A decade of educational change. *Journal of Educational Change, 10*(2) 89-101.

Herche, J., & Engelland, B. (1996). Reversed-polarity items and scale unidimensionality. *Journal of the Academy of Marketing Science, 24*(4), 366-374.

Holladay, C. L., & Quinones, M. A. (2003). Practice variability and transfer of training: The role of self-efficacy generality. *Journal of Applied Psychology, 88,* 1094-1103.

Holton, E. F., III. (1996). The flawed four-level evaluation model. *Human Resource Development Quarterly, 7*(1), 5-21.

Holton, E. F., III, Bates, R. A., Bookter, A. I., & Yamkovenko, V. B. (2007). Convergent and divergent validity of the learning transfer system inventory. *Human Resource Development Quarterly, 18*(3), 385-419.

Holton, E. F., III, Bates, R. A., & Ruona, W. E. A. (2000). Development of a generalized learning transfer system inventory. *Human Resource Development Quarterly, 11,* 333-360.

Holton, E. F., III, Bates, R. A., Seyler, D. L., & Carvalho, M. B. (1997). Toward construct validation of a transfer climate instrument. *Human Resource Development Quarterly, 8*(2), 95-113.

Hoy, W. K. (2012). School characteristics that make a difference for the achievement of all students: A 40-year academic odyssey. *Journal of Educational Administration, 50,* 76-97.

Hoy, W. K., Tarter, C. J., & Kottkamp, R. B. (1991). *Open schools, healthy schools: Measuring organizational climate*. Thousand Oaks, CA: Sage.

Huberman, M., & Miles, M. B. (1984). *Innovation up close: How school improvement works.* New York, NY: Plenum.

Jamieson, S. (2004). Likert scales: How to (ab)use them. *Medical Education, 38,* 1212-1218.

Jex, S. M., & Gudanowski, D. M. (1992). Efficacy beliefs and work stress: An exploratory study. *Journal of Organizational Behavior, 13*, 509-517.

Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Joyce, B., & Showers, B. (1981). Transfer of training: The contribution of "coaching." *Boston University of Education Journal of Education, 16*(2), 163-172.

Kellett, J. B., Humphrey, R. H., & Sleeth, R. G. (2009). Career development, collective efficacy, and individual task performance. *Career Development International, 14*(6), 534-546.

Kirkpatrick, D. (1959). Techniques for evaluating training programs. *Journal of the American Society for Training and Development, 13*, 3-9.

Kim, J. H., & Callahan, J. L. (2013). Finding the intersection of the learning organization and learning transfer: The significance of leadership. *European Journal of Training and Development, 37*(2), 183-200.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30,* 607-610. doi:10.1177/001316 447003000308

Kozlowski, S. W. J., & Salas, E. (1997). A multilevel organizational systems approach for the implementation and transfer of training. In J. K. Ford, S. W. J. Kozlowski, K. Kraiger, E. Salas, & M. S. Teachout (Eds.), *Improving training effectiveness in work organizations* (pp. 247-287). Mahwah, NJ: Lawrence Erlbaum Associates.

Learning Forward. (2011). *Standards for professional learning*. Oxford, OH: Author.

Leithwood, K., & Louis, K. S. (Eds.). (1999). *Organizational learning in schools.* Dordrecht, Netherlands: Kluwer Academic Press.

Little, J. W. (1997). *Excellence in professional development and professional community* (Working paper, Benchmarks for schools). Washington, DC: Office of Educational Research and Improvement.

Lim, D. H., & Johnson, S. D. (2002). Trainee perceptions of factors that influence learning transfer. *International Journal of Training and Development, 6*, 36-48.

Marsick, V. J., & Watkins, K. E. (2003). Demonstrating the value of an organization's learning culture: The dimensions of learning organizations questionnaire. *Advances in Developing Human Resources, 5*(2), 132-151.

Martin, H. J. (2010). Workplace climate and peer support as determinants of training transfer. *Human Resource Development Quarterly, 21*, 87-104.

Mathieu, J. E., Tannenbaum, S. I., & Salas, E. (1992). Influences of individual and situational characteristics on measures of training effectiveness. *Academy of Management Journal, 35*(4), 828-847.

McCharen, B., Song, J., & Martens, J. (2011). School innovation: The mutual impacts of organizational culture learning, and creativity. *Educational Management, Administration and Leadership, 39*(6), 695-711. doi:10.1177/1741143211416387

Muijs, D. (2006). New directions for school effectiveness research: Towards school effectiveness without schools. *Journal of Educational Change, 7,* 141-160.

Nathans, L. L., Oswald, F. L., & Nimon, K. (2012). Interpreting multiple linear regression: A guidebook of variable importance. *Practical Assessment, Research, & Evaluation, 17*(9), 2. Retrieved from http://pareonline.net/pdf/v17n9.pdf

National Center for Education Statistics. (2012). *Digest of education statistics, 2011* (NCES Report No. 2012-001). Washington, DC: U.S. Department of Education.

Nimon, K. (2010). Regression commonality analysis: Demonstration of an SPSS solution. *Multiple Linear Regression Viewpoints, 36*(1), 10-17.

Nimon, K. F. (2012). Statistical assumptions of substantive analyses across the general linear model: A mini-review. *Frontiers in Psychology, 3,* 322. doi:10.3389/fpsyg.2012.00322

Nimon, K. F. (n.d.). *Commonality script*. Retrieved from http://profnimon.com/commonality.sbs

Nimon, K., Lewis, M., Kane, R., & Haynes, R. M. (2008). An R package to compute communality coefficients in the multiple regression case: An introduction to the . package and a practical example. *Behavior Research Methods, 40,* 457-466.

Nimon, K., & Reio, T. G., Jr. (2011). Regression commonality analysis: A technique for quantitative theory building. *Human Resource Development Review, 10*(3), 329-340.

Noe, R. A. (1986). Trainee attributes and attitudes: Neglected influences on training effectiveness. *Academy of Management Review, 11,* 736-749.

Noe, R. A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology, 39,* 497-523.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*(3), 376-407.

Ortenblad, A. (2002). A typology of the idea of learning organization. *Management Learning,*

33(2), 213-230.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, *62*(3), 307-333.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, *66*, 543-578.

Parker, L. E. (1994). Working together: Perceived self- and collective efficacy at the workplace. *Journal of Applied Social Psychology*, *24*, 43-59.

Pereira, J., Bruera, E., & Quan, H. (2001). Palliative care on the net: An online survey of health care professionals. *Journal of Palliative Care*, *17*(1), 41.

Qualtrics 12.018. (2012). Graduate student version [Computer Software]. Provo, UT: Qualtrics Lab.

Quiñones, M. A. (1995). Pretraining context effects: Training assignment as feedback. *Journal of Applied Psychology*, *80*(2), 226.

Richman-Hirsch, W. L. (2001). Posttraining interventions to enhance transfer: The moderating effects of work environments. *Human Resource Development Quarterly*, *12*(2), 105-120.

Riggs, M. L., & Knight, P. A. (1994). The impact of perceived group success-failure on motivational beliefs and attitudes: A causal model. *Journal of Applied Psychology*, *79*, 755-766.

Reio, T. G. (2010). The threat of common method variance bias to theory building. *Human Resource Development Review*, *9*(4), 405-411.

Romano, J. C., & Chen, J. M. (2011). *A usability and eye-tracking evaluation of four versions of the online National Survey for College Graduates (NSCG): Iteration 2* (Report No. SSM2011-01). Washington, DC: U.S. Census Bureau. Retrieved from http://www.census.gov/srd/papers/pdf/ssm2011-01.pdf

Rosenthal, R., & Rubin, D. B. (2003). *r* (equivalent): A simple effect size indicator. *Psychological Methods*, *8*(4), 492-496.

Ross, J. A., Hogaboam-Gray, A., & Gray, P. (2004). Prior student achievement, collaborative school processes, and collective teacher efficacy. *Leadership and Policy in Schools*, *3*(3), 163-188.

Rouiller, J. Z., & Goldstein, I. L. (1993). The relationship between organizational transfer climate and positive transfer of training. *Human Resource Development Quarterly*, *4*,

377-390.

Sauermann, H., & Roach, M. (2012). Increasing web survey response rates in innovation research: An experimental study of static and dynamic contact design features. *Research Policy*.

Salas, E., & Cannon-Bowers, J. A. (2001). The science of training: A decade of progress. *Annual Review of Psychology, 52,* 471-499.

Salas, E., Nichols, D. R., & Driskell, J. E. (2007). Testing three team training strategies in intact teams: A meta-analysis. *Small Group Research, 38,* 471-488.

Schein, E. H. (1997). *Organizational culture and leadership*. San Francisco, CA: Jossey Bass.

Schoen, L. T., & Teddlie, C. (2008). A new model of school culture: A response to a call for conceptual clarity. *School Effectiveness and School Improvement, 19*(2), 129-153.

Schriesheim, C. A., Hinkin, T. R., & Podsakoff, P. M., (1991). Can ipsative and single-item measures produce erroneous results in field studies of French and Raven's (1959) five bases of power? An empirical investigation. *Journal of Applied Psychology, 76,* 106-114

Senge, P. M. (1990). *The fifth discipline*: *The art and practice of the learning organization.* New York, NY: Doubleday and Company.

Senge, P., Kleiner, A., Roberts, C., Ross, R., & Smith, B. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization.* London, UK: Nicholas Brealey.

Sheehan, K. B., & McMillan, S. J. (1999). Response variation in e-mail surveys: An exploration. *Journal of Advertising Research, 39*(4), 45-54.

Smith-Jentsch, K., Salas, E., & Brannick, M. T. (2001). To transfer or not to transfer? Investigating the combined effects of trainee characteristics, team leader support and team climate. *Journal of Applied Psychology, 86,* 279-292.

Solomon, D. J. (2001). Conducting web-based surveys. *Practical Assessment, Research & Evaluation, 7*(19). Retrieved from http://PAREonline.net/getvn.asp?v=7&n=19

Song, J. H., & Chermack, T. J. (2008) Assessing the psychometric properties of the dimensions of the learning organization questionnaires (DLOQ) in the Korean context. *International Journal of Training and Development, 12*(2), 87-99.

Song, J. H., Jeung, C., & Cho, S. Y. (2011). The impact of the learning organization environment on the organizational learning process. *Learning Organization Journal, 18*(6), 468-495.

Sookhai, F., & Budworth, M.-H. (2010). The trainee in context: Examining the relationship between self-efficacy and transfer climate for transfer of training. *Human Resource Development Quarterly, 21*, 257-272. doi:10.1002/hrdq.20044

Supovitz, J. A., & Turner, H. M. (2000). The effects of professional development on science teaching practices and classroom culture. *Journal of Research in Science Teaching, 37*(9), 963-980.

Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). New York, NY: Routledge.

Stieger, S., Reips, U. D., & Voracek, M. (2007). Forced response in online surveys: Bias from reactance and an increase in sex specific dropout. *Journal of the American Society for Information Science and Technology, 58*(11), 1653-1660.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Needham Heights, MA: Allyn and Bacon.

Timperley, H., & Alton-Lee, A. (2008). Reframing teacher professional learning: An alternative policy approach to strengthening valued outcomes for diverse learners. *Review of Research in Education, 32*, 328-369.

Tracey, J. B., Tannenbaum, S. I., & Kavanagh, M. J. (1995). Applying trained skills on the job: The importance of the work environment. *Journal of Applied Psychology, 80*(2), 239-252.

Tschannen-Moran, M., & Barr, M. (2004). Fostering student learning: The relationship of collective teacher efficacy and student achievement. *Leadership and Policy in Schools, 3*(3), 189-209.

Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research, 68*(2), 202-248.

Tziner, A., Fisher, M., Senior, T., & Weisberg, J. (2007). Effects of trainee characteristics on training effectiveness. *International Journal of Selection and Assessment, 15*, 167-174.

Urbaniak, G. C., & Plous, S. (2011). *Research randomizer* (Version 4.0) [Computer software]. Retrieved from http://www.randomizer.org/

Velada, R., & Caetano, A. (2007). Training transfer: The mediating role of perception of learning. *Journal of European Industrial Training, 31*, 283-296.

Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley.

Watkins, K. E., & Marsick, V. J. (1993). *Sculpting the learning organization: Lessons in the art and science of systemic change*. San Francisco, CA: Jossey-Bass.

Watkins, K. E., & Marsick, V. J. (1996). *In action: Creating the learning organization.* Alexandria, VA: American Society for Training and Development.

Watkins, K. E., & Marsick, V. J. (1997). *Dimensions of the learning organization.* Warwick, RI: Partners for the Learning Organization.

Watkins, K. E., & Marsick, V. J. (2003). Demonstrating the value on an organization's learning culture: The dimensions of the learning organization questionnaire. In K. E. Watkins, V. J. Marsick, & S. D. Johnson (Eds.), *Making learning count! Diagnosing the learning culture in organizations* (pp. 132-151). Newbury Park, CA: Sage.

Watson, C. B., Chemers, M. M., & Preiser, N. (2001). Collective efficacy: A multilevel analysis. *Personality and Social Psychology Bulletin, 27*(8), 1057-1068.

Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Dallas, TX: National Staff Development Council.

Weldy, T. (2009). Learning organization and transfer: Strategies for improving performance. *Learning Organization, 16*(1), 58-68.

Williams, D. M. (2010). Outcome expectancy and self-efficacy: Theoretical implications of an unresolved contradiction. *Personality and Social Psychology Review, 14*(4), 417-425. doi:10.1177/1088868310368802

Witmer, D. F., Colman, R. W., & Katzman, S. L. (1999). From paper-and-pencil to screen-and-keyboard. In S. Jones (Ed.), *Doing internet research: Critical issues and methods for examining the net* (pp. 145-162). Thousand Oaks, CA: Sage.

Yamnill, S., & McLean, G. N. (2001). Theories supporting transfer of training. *Human Resource Development Quarterly, 12*(2), 195-208.

Yamnill, S., & McLean, G. N. (2005). Factors affecting transfer of training in Thailand. *Human Resource Development Quarterly, 16*(3), 323-344.

Yang, B. (2003). Identifying valid and reliable measures for dimensions of a learning culture. *Advances in Developing Human Resources, 5*(2), 152-162.

Zaccaro, S. J., Blair, V., Peterson, C., & Zazanis, M. (1995). Collective efficacy. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment theory: Research and application* (pp. 305-328). New York, NY: Plenum.

Zellars, K. L., Hochwarter, W. A., Perrewe, P. L., Miles, A. K., & Kiewitz, C. (2001). Beyond self-efficacy: Interactive effects of role conflict and perceived collective efficacy. *Journal of Managerial Issues, 13*(4), 483-499.