THE INFLUENCE OF SCHOOL FACTORS ON TEACHER EFFICACY IN STUDENT ENGAGEMENT

by

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B.A., Kansas State University, 2003

M.S., Emporia State University, 2008

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Abstract

Teachers' ability to engage students is in influenced by teachers' collective efficacy beliefs. Yet, empirical evidence on the relationship between the social persuasion variables of schools and teacher collective efficacy in student engagement is limited. This study was designed to answer the following research question: "To what extent do teachers' perceptions of professional development opportunities (PPDO), school leadership (PSL), and school use of performance feedback (PPF) relate to teachers' collective efficacy in student engagement (CESE)?"

To explore the relationship between teacher collective efficacy in student engagement and the social persuasion variables of schools, extant data from 262 teachers in a large urban school district in the United States was supplied through the Measures of Effective Teaching (MET) project. Scaled scores of independent and dependent variables were used to examine the relationship between the independent variables (perception of professional development opportunities, school leadership, and the use of performance feedback), and the dependent variable (collective efficacy in student engagement).

A multiple regression of social persuasion variables was conducted to examine the relationship between the variables and to determine which variable, if any, has the most influence on the dependent variable. The multiple regression analysis showed that a combination of the independent variables of PPDO and PSL could explain 37% of the variance in CESE. Analyses also showed that PPDO had the strongest relationship with CESE. The results reinforce information from the literature review regarding the research questions and hypotheses. The social persuasion variables of schools are correlated with collective efficacy in student engagement. Perceptions of the use performance feedback, professional development

opportunities, and school leadership are all significantly correlated with collective efficacy in student engagement. Out of the three social persuasion variables analyzed, only perception of professional development opportunities and school leadership explain a significant amount of the variance in collective efficacy in student engagement.

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Dedication

This dissertation is dedicated to my parents, wife, and children who have never waivered in their support of my academic, professional, and personal goals. Their belief in me has given me the courage and strength to pursue doctoral studies.

Chapter 1: Introduction

Teachers' ability to engage students is in influenced by their collective efficacy beliefs. This chapter begins with an overview of the issues associated with collective efficacy in student engagement. Next, the research problem is stated and the research question is identified. This is followed by a brief preview of the methodology that was employed and a discussion of the significance of the study. Essential terms are also defined.

Overview of the Issues

The effects of efficacy beliefs on teaching and learning are being widely explored in research. The following issues are examined in this section: (1) individual efficacy, (2) collective efficacy, (3) collective efficacy in student engagement, and (4) a description of the Teacher Working Conditions Survey (TWCS) utilized in this research as the source of extant data.

Individual Efficacy

Individual efficacy refers to a person's assessment of his or her own capabilities to attain a desired level of performance on a specific task (Bandura, 1977). According to Albert Bandura (1997), individual efficacy beliefs play an important role in individual functioning and are sometimes referred to as self-efficacy. Efficacy is an important component of agency, or intentional action, and influences an individual's choice of task, effort, and persistence (Bandura, 1986). Simply put, unless individuals believe that they can produce desired results and forestall undesirable outcomes, they have little incentive to act. Cultivating individual competence and belief in one's own capability is, therefore, crucial in helping teachers and schools to use their talents effectively (Bandura, 1982; Wood & Bandura, 1989).

Teacher individual efficacy has generally been defined as educators' "judgments about their abilities to promote student learning" (Woolfolk Hoy & Spero, 2005, p. 343). These judgments include a teacher's beliefs in his or her ability to organize and execute courses of action required to be successful in specific teaching tasks set in particular contexts (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Individual efficacy has an ongoing effect on teacher beliefs, behaviors, and performance (Putman, 2012). These beliefs drive teachers to act in certain ways and have an impact on the learning environment itself (Martin, Sass, & Schmitt, 2012; van Uden, Ritzen, & Pieters, 2013). Teachers with substantial self-efficacy are more likely to achieve desired results in schools because they are more likely to anticipate success, allocate substantial effort, persist despite arising difficulties, and effectively navigate challenges (Bandura, 1986, 1997; Guo, Justice, Sawyer, & Tompkins, 2011).

It is important to note that increased efficacy will generally lead to increased effort, persistence, and high levels of performance, while lower efficacy results either in giving up easily or not ever initiating an activity at all (Bandura, 1977). Therefore, identifying ways to improve teacher efficacy is a means through which schools might seek to improve student engagement and learning (Cheung, 2008).

Collective Efficacy and Social Persuasion

Researchers recognize that individuals do not work in isolation, and therefore also form beliefs about the *collective* capabilities of the groups to which they belong (Klassen, Usher, & Bong, 2010). Inquiry into collective efficacy has emphasized that teachers not only have self-referent efficacy perceptions, but also beliefs regarding their school organizations' collaborative capabilities (Goddard, Hoy, & Woolfolk Hoy, 2004). Bandura (1997) and Goddard, Hoy, and Woolfolk Hoy (2000) define *collective efficacy* as "a group's shared belief in it's conjoint

capabilities to organize and execute the courses of action required to produce given levels of attainment" (p. 477).

Teacher collective efficacy significantly predicts student achievement beyond the impact of student socioeconomic status (Adams & Forsyth, 2006; Bandura, 1993; Goddard, LoGerfo, & Hoy, 2004; Goddard, Hoy, & Woolfolk Hoy, 2000; McCoach & Colbert, 2010). In addition, collective teacher efficacy is associated with student learning outcomes, teacher motivation, and teacher performance in teaching practices (Lee, Zhang, & Yin, 2011). Collective efficacy also has a multiplying effect on a teachers' sense of mastery and improves school culture (Kennedy & Smith, 2013). Thus, a great need exists for researchers to explore collective efficacy and ways to improve it (Bandura, 2000).

Bandura's (1986, 1997) work in Social Cognitive Theory (SCT) attributes efficacy beliefs to four major sources: mastery experience, vicarious experiences, affective states, and social persuasion. Mastery experience involves the perception that a past approach or performance has been successful, and will likely be so again in the future. Vicarious experience is one in which an approach, technique or behavior is modeled by someone else. Affective states involve the physiological responses aroused—either anxiety or excitement—that contribute to an individual's perceptions of self-capability or incompetence. Social persuasion is yet another factor that influences teachers' collective conviction to reach their goals (Bandura, 1997). *Social persuasion* is defined as verbal persuasion or other suggestive influences offered directly or indirectly for corrective performance (Bandura, 1977).

Of these four sources of efficacy, the influence of mastery experiences has been examined the most extensively and been identified empirically as having the most influence (Bandura, 1986; Chong, Klassen, Huan, Wong, & Kates, 2010; Goddard et al., 2004). The

influence of social persuasion, however, has received far less attention in the literature. This is unfortunate since social persuasion is another means by which schools can possibly strengthen faculty's conviction of their own capabilities, support persistence, improve problem solving, and ability to achieve organizational goals (Goddard et al., 2000; Goddard & Goddard, 2001).

Social persuasion entails encouragement or specific performance feedback from a supervisor or colleague; it may involve discussions in schools, the community, or media about the ability of teachers to influence students (Goddard, et al., 2004). Other sources of social persuasion include a school's use of performance feedback, professional development opportunities, and school leadership (Goddard, 2001; Goddard et al., 2000; Goddard, Hoy, & Hoy, 2004; Goddard, LoGerfo, & Hoy, 2004). Research has consistently demonstrated that collective efficacy beliefs are subject to social influence, but the vast majority of collective efficacy studies focus on the outcomes of organized activity rather than the influence of social persuasion variables of schools on perceived collective efficacy (Goddard & Skrla, 2006).

In research, evidence exists that collective efficacy beliefs are shaped by the social persuasion variable of *performance feedback*, or the provision of information about individual or group behaviors or skills in order to allow individuals to adjust their performance (Gibson & Earley, 2007; Gist & Mitchell, 1992; Lester, Meglino, & Korsgaard, 2002; Marks, Mathieu, & Zaccaro, 2001; Tasa, Taggar, & Seljts, 2007). Feedback is considered a powerful contributor to the development of team performance and helps groups to regulate and monitor themselves in order to effectively complete a task (Kozlowski & Ilgen, 2006; London & Sessa, 2006). Researchers also insist that teacher interaction with colleagues or peers in the form of feedback can stimulate individual reflection of teachers (Kohler & Ezell, 1999; Parsons & Stephenson,

2005) and that constructive performance feedback can increase collective efficacy perceptions (Jung & Sosik, 2003).

Another social persuasion variable influencing collective efficacy is *school leadership*, or school system leaders who perform administrative decision-making roles in areas such as staffing, training, compliance, and protocol. An emerging body of research, though in its early stages, suggests a number ways in which school leadership influences teacher collective efficacy. For example, the more opportunities that school leadership provides for teachers to participate in instructionally relevant school decisions, "the more likely a school is to be characterized by a robust sense of collective efficacy" (Goddard et al., 2004, p. 10). In addition, leaders have an impact on the knowledge and effectiveness of their teachers (Brinson & Steiner, 2007) and can augment collective efficacy by fostering teacher collaboration (Pfaff, 2000). However, the link between school leadership and collective efficacy has yet to be well established (Tschannen-Moran & Hoy, 2001; Wahlstrom & Louis, 2008).

A third persuasion variable influencing collective efficacy is *professional development,* or activities and efforts designed to improve educator effectiveness and student learning. Professional development opportunities allow teachers to come together and work in teams to stimulate "group thinking," which contributes to collective efficacy (Zambo & Zambo, 2008). Professional development that allows teachers to work and learn together fosters a sense of collective accountability and fidelity in implementing new practices and results in higher teacher efficacy (Fritz, Miller-Heyl, Kreutzer, & MacPhee, 1995; Rimm-Kaufman & Sawyer, 2004).

Collective Efficacy in Student Engagement

Efficacy is domain specific—varying from task to task or from context to context (Bandura, 1986) making it necessary to examine efficacy in specific areas and undertakings (Goddard, Hoy, & Woolfolk Hoy 2004; Tschannen-Moran & Woolfolk Hoy, 2001). This might include teacher efficacy in instructional innovation (Guskey, 1998), in classroom management (Brouwers & Tomic, 2000; Lee, Zhang, & Yin, 2011), and more recently, in student engagement.

Collective efficacy in student engagement centers on a group's perceived ability to provide support for learning and to motivate all students, including difficult and struggling learners (Martin, Sass, & Schmitt, 2012). Efficacy in student engagement reflects the level of teacher confidence to help students become and remain involved and invested in learning (Wolters & Daugherty, 2007).

Statement of the Problem

Much of educational research and reform over the past two decades has examined ways to improve student learning and student achievement (Darling-Hammond, 2010). As a result, a wave of educational reform has sought to improve schools and classrooms through increased attention to core content, rigorous assessment, curricular standards, and efforts to improve teacher quality. Yet it has only been recently that much work has been done that specifically examines how students engage in learning tasks and what institutions can do to support teachers in their efforts to engage students. Empirical evidence on the relationship between the social persuasion variables of schools and teacher collective efficacy in student engagement is limited.

Empirical evidence suggests a contextual effect regarding school environmental factors, but these school variables have yet to be fully explored (Adams & Forsythe, 2006; Kennedy & Smith, 2013). To date, no specific exploration of the social persuasion variables of schools on teachers' collective efficacy in student engagement has been conducted. A review of the literature on teacher collective efficacy suggested three social persuasion variables in schools that have not been explored specifically in connection to collective efficacy in student engagement. These contextual factors include the use of performance feedback, professional development opportunities, and school leadership.

Research Questions

The research questions for this study were based on a desire to generate new knowledge about factors that could be related to collective efficacy beliefs. Due to growing interest in collective efficacy, the literature review, and a lack of empirical evidence on the relationship between social persuasion variables in schools and collective efficacy in student engagement, this research study gathered information related to the following research questions:

RQ1: Is collective efficacy in student engagement (CESE) positively correlated with perception of the use of performance feedback (PPF)?

$H1_0$: There is no positive relationship between the use of performance feedback and teachers' collective efficacy in student engagement.

$H1_A$: There is a significant positive relationship between the use of performance feedback and teachers' collective efficacy in student engagement.

RQ2: Is collective efficacy in student engagement (CESE) positively correlated with perception of professional development opportunities (PPDO)?

$H2_0$: There is no positive relationship between perception of professional

development opportunities and teachers' collective efficacy in student

engagement.

$H2_A$: There is a significant positive relationship between perception of

professional development opportunities and teachers' collective efficacy in

student engagement.

RQ3: Is collective efficacy in student engagement (CESE) positively correlated with

perception of school leadership (PSL)?

$H3_0$: There is no positive relationship between perception of school leadership

and teachers' collective efficacy in student engagement.

$H3_A$: There is a significant positive relationship between perception of school

leadership and teachers' collective efficacy in student engagement.

RQ4: Can a combination of the social persuasion variables of perception of the use of

performance feedback (PPF), perception of professional development opportunities

(PPDO), and perception of school leadership (PSL) predict scores on collective efficacy

in student engagement (CESE)?

$H4_o$: Combined, the variables cannot predict a CESE score.

$H4_A$: Combined, the variables can predict a CESE score.

Research Methodology

This study sought to explore possible correlations between perceived collective efficacy

in student engagement and teacher perception of the school's use of performance feedback,

professional development opportunities, and school leadership. To do so, correlation and

multiple regression analyses were run on participant responses to the Teacher Working

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Conditions Survey (TWCS) obtained through the Measures of Effective Teaching Project (MET).

Significance of the Study

The intent of this study is to add power to the explanation of collective teacher efficacy. Specifically, this study aims to identify evidence of the influence of social persuasion variables such as school leadership, the use of performance feedback, and professional development opportunities on collective efficacy in student engagement. Efficacy beliefs shape how teachers behave in the classroom and impact student learning (Martin, Sass, & Schmitt, 2012). Collective efficacy also contributes to academic achievement (Bandura, 1993; Tschannen-Moran & Barr, 2004), student engagement, and has the potential to reduce dropout rates (van Uden et al., 2013). This study could, therefore, provide information that will facilitate the development of collective efficacy in student engagement and of teacher collective efficacy in general. Short-term outcomes could yield improved teacher practices, which in turn, could produce higher levels of student engagement, improved student achievement, and lowered dropout rates.

Definition of Terms

Collective efficacy: A group's shared belief in it's conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment (Bandura, 1997; Goddard et al., 2000).

Collective efficacy in student engagement: An element of collective teacher efficacy that focuses on groups' perceived ability to provide support for learning and to motivate and engage students (Martin et al., 2012).

Individual Efficacy: An individual's assessment of his or her own capabilities to attain a desired level of performance on a specific task (Bandura, 1977). Individual efficacy is also often referred to as self-efficacy.

Performance feedback: The provision of information about individual or group behaviors or skills in order to allow individuals to adjust their performance (Alvero, Bucklin, & Austin, 2001; Gabelica, Bossche, Segers, & Gijselaers, 2012).

Professional development: activities and efforts designed to improve educator effectiveness and student learning. These activities include—but are not limited to—courses, workshops, involvement in the production of curricula, the discussion of assessment data or the sharing of strategies (Avalos, 2011).

Social persuasion: Verbal persuasion or other suggestive influences offered directly or indirectly to guide performance (Bandura, 1977). Social persuasion entails encouragement or specific performance feedback from a supervisor or colleague or may involve discussions in schools, the community, or media about the ability of teachers to influence students (Goddard, et al., 2004).

Student engagement: A form of active participation and involvement in learning, as opposed to apathy or superficial participation (Chapman, 2003; Newmann, 1992).

School Leadership: school system leaders who perform administrative decision-making roles in areas such as staffing, training, compliance, and protocol. School leadership includes—but is not limited to—superintendents, assistant superintendents, building principals, assistant principals, and curriculum directors.

Conclusions

Teachers' ability to engage students is in influenced by their collective efficacy beliefs. While the effects of efficacy beliefs on teaching and learning are being widely explored, research is just beginning to examine the influence of social persuasion variables on teacher collective efficacy in student engagement. Of particular interest in this study are the social persuasion variables including the use of performance feedback, school leadership, and professional development opportunities.

This study aims to examine the relationship between social persuasion variables and to determine which variable, if any, has the most influence on collective efficacy in student engagement. Data obtained from the study may be used to improve collective efficacy in student engagement as well as student achievement.

Chapter 2: Review of the Literature

This study explored the relationships between teacher collective efficacy in student engagement and the social persuasion variables in schools. Literature relevant to the research conducted will be presented in this chapter in the following sections: (a) individual efficacy, (b) Social Cognitive Theory, (c) collective efficacy, (d) teacher influences on student engagement, (e) collective efficacy in student engagement, and (f) school-based social persuasion variables.

Individual Efficacy

Teachers not only bring specific teaching techniques and strategies to the classroom, but also their own beliefs about their students, about learning, and about themselves as educators. Over the past three decades, compelling evidence has been accumulated that reveals the relationship between student achievement, and teacher's *individual efficacy,* or assessment of one's own capabilities to attain a desired level of performance on a specific task (Bandura, 1977). In their historical overview of teacher efficacy, Goddard, Hoy, and Woolfolk-Hoy (2000) first attributed teacher efficacy theory to J. B. Rotter in 1966. Rotter conceived teacher efficacy as "the extent to which teachers believed that they could control the reinforcement of their actions. The critical question was whether control of reinforcement lay within the teachers themselves or in the environment" (Goddard et al., 2000, p. 481).

Individual efficacy includes judgments and beliefs about one's own capability to impact students' motivation and learning (Tschannen-Moran & Woolfolk Hoy, 2007) and to organize and execute courses of action in specific teaching tasks and contexts (Tschannen-Moran et al., 1998). Individual efficacy beliefs "determine how people feel, think, motivate themselves and behave" (Bandura, 1997, p. 17). Thus, individual efficacy is an important component of agency,

and impacts success that results from intentional action on the part of educators (Bandura, 1986).

Efficacy in education has been investigated for nearly thirty years and has been developed in

relation to teachers, students, leadership, and educational organizations.

Individual efficacy drives teachers to act in certain ways and impacts classroom learning

(Martin et al., 2012; Putman, 2012; Tschannen-Moran & Woolfolk Hoy 2001; van Uden et al.,

2013). Efficacy has an ongoing effect on teacher beliefs, behaviors, and performance (Putman,

2012). Efficacy also affects teacher orientation towards educational processes and specific

instructional activities (Bandura, 1997). It is important to note that increased efficacy will

generally lead to increased teacher effort, persistence, and high levels of performance, while

lower efficacy results either in giving up easily or failure to initiate an activity at all (Bandura,

1977).

Individual efficacy is highly associated with teacher motivation, which in turn, is

associated with student achievement (Bandura, 1993, 1997; Zambo & Zambo, 2008). Teachers

with substantial individual efficacy are more likely to achieve desired results in schools because

they are more likely to anticipate success, allocate substantial effort, persist despite arising

difficulties, and effectively navigate challenges (Bandura, 1986, 1997; Guo et al., 2011).

Teachers with a strong sense of efficacy are more open to new ideas and are more likely to try

out new strategies (Goddard et al., 2000). In other words, "teachers with a strong sense of

individual efficacy believe they can and do make a difference in the lives of their students and

that their students will achieve" (Zambo & Zambo, 2008, p. 160). Of paramount importance to

this study is the positive correlation found between teacher efficacy and student motivation,

engagement, and achievement (Ashton & Webb, 1986; Gibson & Dembo, 1984; Lashinsky,

2012; Pajares, 1992).

A substantial body evidence points towards the strong influence of peoples' beliefs about themselves on their actions (Linnenbrink & Pintrich, 2002, 2003; Margolis & McCabe, 2004; Ormrod, 2013; Schunk, 2001; Schunk, Meece, & Pintrich, 2014; Walker, 2003; Zimmerman, 1995, 2001). Likewise, teachers devoid of confidence in their ability to motivate and engage students are less likely to put forth the effort required for preparation and delivery needed, even if they possess the ability to do so (Tschannen-Moran & Johnson, 2011). Therefore, educators' self-efficacy beliefs become self-fulfilling prophecies, validating either their belief of capability or of incompetence (Tschannen-Moran & Johnson, 2011). Simply put, unless individuals believe that they can produce desired results and forestall undesirable outcomes, they have little incentive to act. Cultivating individual competence and belief in one's own capability is, therefore, crucial in helping teachers and schools to use their talents effectively (Bandura, 1988; Wood & Bandura, 1989). Identifying ways to improve teacher efficacy is a means through which schools might seek to improve student engagement and learning (Cheung, 2008).

Social Cognitive Theory

Social Cognitive Theory (SCT; Bandura 1997) underpins much of the research surrounding teacher efficacy (Goddard, Hoy, & Woolfolk Hoy, 2004; Goddard, LoGerfo, & Hoy, 2004). This theory is concerned with human agency, or ways that individuals exercise control over their lives (Goddard et al., 2000). A central tenant of SCT is that individual and collective choice results from the exercise of agency, and that our choices and actions are greatly influenced by our individual or collective organization's efficacy beliefs (Bandura, 2001; Goddard et al., 2004). SCT posits that human knowledge acquisition and chosen courses for action are the result of prior experience and observance of other individuals (Bandura, 2000;

Zimmerman, 1989), and that human functioning is the product of a dynamic interplay of personal, behavioral, and environmental influences (Wood & Bandura, 1989).

The construct of teacher individual efficacy was largely the result of Bandura's (1986) Social Cognitive Theory (SCT), and suggested that teacher behavior resulted from the interaction of personal, behavioral, and environmental influences. A teacher's individual-efficacy was initially defined as "what you believe you can do with what you have under a variety of circumstances" (Bandura, 1986, p. 37). Bandura (1997) later posited that self-belief is powerful influence our success, our ability to act, and that this efficacy was more powerful than one's actual abilities for the task at hand in influencing people's level of motivation, affective states, and actions. Bandura, Barbaranelli, Capara, and Pastorielli (1996) added that "unless people believe that they can produce desired effects by their actions, they have little incentive to act" (p. 1206). In more recent research founded on SCT, a definition of individual efficacy has taken shape as an educator's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning" (Tschannen-Moran & Woolfolk Hoy, 2001, p. 783).

The framework of Social Cognitive Theory attributes efficacy beliefs to four major sources: mastery experience, vicarious experiences, affective states, and social persuasion (Bandura, 1997). Mastery experience involves the perception that a past approach or performance has been successful, and will likely be so again in the future. Vicarious experience is one in which an approach, technique or behavior is modeled by someone else. Affective states involve the physiological responses aroused—either anxiety or excitement—that contribute to an individual's perceptions of self-capability or incompetence. Social persuasion is defined as verbal persuasion or other suggestive influences offered directly or indirectly for corrective performance (Bandura, 1977).

Of these four sources of efficacy, the influence of mastery experiences has been examined the most extensively and been identified empirically as having the most influence (Bandura, 1986; Chong et al., 2010; Goddard et al., 2004). The influence of social persuasion, however, has received far less attention in the literature. This is unfortunate since social persuasion is another means by which schools can seek to strengthen faculty's conviction of their own capabilities, support persistence, improve problem solving, and ability to achieve organizational goals (Goddard et al., 2000; Goddard & Goddard, 2001).

Collective Efficacy

Researchers also recognize that individuals do not work in isolation, and therefore also form efficacy beliefs about the collective capabilities of the groups to which they belong (Klassen et al., 2010). In contrast to individual efficacy, *collective efficacy* is a group's shared belief in it's conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment (Bandura, 1997; Goddard et al., 2000). These courses of action include organizing and executing teaching practices designed to help students be successful and to improve their learning.

Collective efficacy beliefs are about a larger group, but are held by individual teachers. As a result, the processes of belief development and the effect of these beliefs on actions are very similar for individual and collective efficacy beliefs (Takahashi, 2011). Goddard et al. (2000) insist that collective efficacy results from the same mastery, social, emotional, and vicarious experiences that influence individual efficacy. Bandura insists, "personal agency operates within a broad network of sociostructural influences" (Bandura, 2001, p. 14). In addition, "social cognitive theory extends the analysis of mechanisms of human agency to the exercise of collective agency" (Bandura, 1997, p. 7). "Collective efficacy is not simply the sum of efficacy

beliefs of individuals. Rather, it is an emergent group-level attribute that is the product of coordinative and interactive dynamics" (Bandura, 1997, p. 7).

Research has given increased attention to collective efficacy due to the positive relationships between a group's collective confidence and group effectiveness (Jung & Sosik, 2003; Parker, 1994). Much like individual efficacy, collective efficacy beliefs affect the degree of effort, innovation, and perseverance of individual members towards collective goals (Bandura, 1997). Research has found that teacher collective efficacy is a significant predictor of student achievement, more so than the impact of student socioeconomic status (Adams & Forsyth, 2006; Goddard, LoGerfo, & Hoy, 2004; McCoach & Colbert, 2010) or a student's home and community (Goddard & Goddard, 2001; Ross & Gray, 2006). Thus, a great need exists for researchers to explore collective efficacy and ways to improve it (Bandura, 2000).

Research also suggests that collective efficacy impacts individual teachers' commitment to shared goals and their commitment to collaborate with others towards these goals (Bandura, 1997; Goddard et al., 2000). Goddard, Hoy, and Woolfolk Hoy, leaders in the field of teacher collective efficacy, emphasize the link between collective efficacy and success in schools (Goddard, Hoy, & Woolfolk-Hoy, 2004, p.8):

> "The strong link between group performance and collective efficacy concerns the resiliency with which the efficacious pursue given goals. Analogous to self-efficacy, collective efficacy is associated with the tasks, level of effort, persistence, shared thoughts, stress levels, and achievement of groups. Furthermore, collective teacher efficacy, within a professional community of educators, has the potential to improve individual teacher efficacy and, more importantly, lead to higher levels of student engagement and achievement."

Recently, efficacy research has shifted away from teachers' individual efficacy, and instead, sought to examine organizational influences over teachers' perceived collective efficacy. Adams and Forsyth (2006), for example, examined data from 79 Midwestern Schools and determined that the socioeconomic status of students, school level, and school structure all significantly influence teachers' collective efficacy. Knoblauch and Woolfolk Hoy (2008) studied 240 student teachers and concluded that the school setting (i.e. rural, suburban, and urban) greatly influenced perceived collective efficacy. Zambo and Zambo's (2008) work with 63 mathematics teachers suggested that teachers' perception of professional development might influence teachers' collective efficacy. Bruce et al. (2010) made similar conclusions in their analysis of data from two separate school districts. Lee, Zhang, and Yin (2011) concluded that collective learning and faculty trust in colleagues contributed greatly to collective efficacy. Moolenarr, Sleegers, and Daly (2012) analyzed data from 53 Dutch elementary schools and identified a significant correlation between teacher collective efficacy and their collaboration with other educators. In their research with 4165 elementary and secondary teachers, Wahlstrom and Louis (2008) identified a significant correlation between teacher collective efficacy and the collaborative, organizational practices of schools.

Recent research has attempted to develop conceptual understanding regarding the formation and influence of perceived collective efficacy (Goddard et al., 2000; Goddard, 2001; Goddard et al., 2004). While SCT explains how individual and group perceptions are cognitively formed, there still exist other underlying factors and circumstances that produce efficacy beliefs which have yet to be explored (Adams & Forsyth, 2006; Brouwers, Tomic, & Boluijt, 2011; Pas, Bradshaw, & Hershfeldt, 2012; Takahashi, 2011).

Teacher Influences on Student Engagement

Engagement has found its way into the mainstream education discussion and debate at both systemic and research levels (Zyngier, 2008). While many characterizations of the term are used in research, *student engagement* is widely recognized as a form of active participation and involvement in learning, as opposed to apathy or superficial participation (Chapman, 2003; Newman, 1992). Many students experience decreasing levels of engagement as they move through the educational system (Fredricks, Blumenfeld, & Paris, 2004; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). While attendance at school may be compulsory, learning in school is dependent on students' agency, or conscious and purposeful effort. Many students' willingness to be compliant with teachers' requests dissipates as students grow older. As a result, improving student learning relies heavily on teachers' abilities to actively involve students in new realms of knowledge, building upon what they know and believe, what they care about now, and their expectations for the future (Brown & Cocking, 2000).

While it is ultimately students who decide whether or not they will actively participate in learning activities (McFadden & Munns, 2002; Zyngier, 2008), teachers' perception and decision making with regards to instructional activities have been shown to influence student engagement (Brewster & Bowen, 2004; Finn & Voelkl, 1993; Marks, 2000; Skinner & Belmont, 1993). Only a handful of studies, however, have examined teachers' perspectives of school factors that may influence student engagement (McMahon & Zyngier, 2009; Ravet, 2007; Zyngier, 2008). These studies highlight several key classroom factors for engaging secondary students.

Student investiture in learning is tied both to the content selected by teachers as well as to the activities selected by teachers to promote students' active engagement with that content

(Connor, 2003; Prince, 2004). Students tend to show preference for classes and classroom activities that regularly foster more participatory learning (Basow, Phelan, & Capoloslo, 2006; Levy & Peters, 2010). As a result, researchers such as McMahon and Zyngier (2009) and Zyngier (2008) suggest the need for pedagogies of engagement. Such pedagogies consisted of articulated objectives, varied learning tools, enthusiasm for the subject matter, relationships with students, high degrees of student participation, and learner choice of tasks and projects. Such an approach has been repeatedly attributed with the power and potential to improve classroom learning and student achievement (Butler-Kisber & Portelli, 2003; Zyngier, 2008).

Research highlights varied perspectives between teachers and students regarding the factors influencing engagement in classroom learning tasks. According to Ravet (2007), teachers often view engagement as the result of student factors such as personal strengths and deficits, family background, peer factors, school changes, and relationship with the teacher. Students, however, provide reasons for their own disengagement that were not articulated by their teachers. These reasons include curricular and contextual factors of the classroom (Cothran & Ennis, 2000; Ravet, 2007). These studies underscore that a minimal amount of research has been done on teacher perspectives of student engagement as well as help to justify the need to empirically build upon the data and information gathered thus far (Kim, Kim, Lee, Spector, & DeMeester, 2013).

While some efforts have been made to support student motivation and engagement through school-wide practices (Comer, 1996), the current research base regarding student motivation and engagement has yet to be translated in ways that support educational decision making (Greenwood, Horton, & Utley, 2002). Student engagement has pushed its way to the top of many educational agendas. In result, an increasing number of teachers are seeking to employ

instructional approaches that foster students' motivation and active participation in learning. But by no means are all teaching strategies equal in their effectiveness or their usefulness with today's students (Dean & Marzano, 2012; Hattie, 2009). Many traditional techniques commonly used with students during class time are often limited in their ability to engage large numbers of students (O'Connor, 2013). Time-honored methods of instruction such as lecture, assigned readings, and even some forms of class discussion have come under attack for their alleged inability to stimulate a high degree of participation and to foster higher order cognitive and attitudinal goals towards learning (Day, 1980; Frederick, 1986; Renner 1993).

Critics of wide-spread use of these and other traditional approaches to teaching have called for more engaging, active learning approaches that provide students with more participatory opportunities to engage in meaningful discussion, interact, write, read, reflect on content, and to use technology to create in ways that requires synthesis of ideas and a demonstrated mastery of academic content (Gee, 2013; Meyers & Jones 1993; Omelicheva & Avdeyeva, 2008; Samples & Copeland, 2013). As a result, many educators have begun to ask what can be done to help students engage in academic tasks and are now exploring new techniques and tools that help students take a more active role in classroom activities (O'Connon, 2013; Park et al., 2012).

The literature on teaching and learning suggests a significant need for educators to craft learning situations that are active, rather than passive (Kuh, Kinzie, Buckly, Bridges, & Hayek, 2006). For the most part, existing research in student engagement has sought to address how students act, think, and feel at school in general. But in the context of a classroom, the determination of a student's degree of engagement in learning activities is the result of an intermingling of three, consistently present factors that include the learner, the teacher, and the

curriculum being covered (Corso, Bundick, Quglia, & Haywood, 2013). These three essential components are often referred to as the "instructional core" of learning (City, Elmore, Finarman, & Teitel, 2009; D'Annolfo & Schumann, 2012; Kukral, 2012; Saphier, 2009).

Bransford, Darling-Hammond, and LePage (2005) provide a useful, conceptual framework for organizing the instructional influences taken into consideration by teachers in their classrooms. This framework consists of (1) knowledge of curriculum content and goals, (2) knowledge of learners and how they learn and develop within social contexts, and (3) knowledge of teaching in light of the content and learners to be taught. Various other researchers similarly identify these curricular and instructional influences often referring to them as subject-matter knowledge, or knowledge of the content and educational goals; pedagogical knowledge, or knowledge about student development and about teaching; and didactic knowledge, or knowledge about how to present teaching materials/lessons (Beijaard, Verloop, & Vermunt, 2000; Borko, 2004; Darling- Hammond, 2006; van Uden et al., 2013). As educational research seeks to more fully tap-in to student engagement in schools, one of the most fruitful approaches is likely to be to focus on constructs such as collective efficacy that impact student learning.

Collective Efficacy in Student Engagement

Due to an increasingly widespread use of collaborative teams both in and out of schools, group efficacy constructs have emerged as one of the keys to understanding group effectiveness (Capelli & Rogovski, 1994; Cohen & Bailey, 1997; Jung & Sosik, 2003). In the research, collective efficacy is often examined in connection to specific objectives (Adams & Forsyth, 2006). After all, perceived efficacy is a report of an anticipated capability to execute actions under precise conditions (Ashton & Webb, 1986; Bandura, 1997). Teacher efficacy is

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considered specific to a given context or task and has been further focused on a variety of areas, including student engagement (Tschannen-Moran & Woolfolk Hoy, 2001).

Collective efficacy in student engagement focuses on groups' perceived ability to provide support for learning and to motivate and engage students (Martin et al., 2012). Recently, research has suggested that higher levels of teacher efficacy in student engagement are tied to both higher levels of student engagement and academic achievement (Linnenbrink & Pintrich, 2003; Maguire, 2011). Pines (2002) suggested the need to foster teacher efficacy in student engagement due to its substantial impact on the quality of instruction. Teachers with higher levels of efficacy in student engagement are also more likely to employ emerging instructional approaches and strategies (Ross, 1998; Tschannen-Moran & Johnson, 2011).

Simply put, teachers' beliefs and intentions influence their actions in the classroom and the subsequent level of engagement and achievement of their students. Thus, there exists a need to continue to explore collective efficacy in the area of student engagement (van Uden, Ritzen, & Pieters, 2013).

School-Based Social Persuasion Variables

Bandura's (2001) framework of social cognitive theory "extends the conception of human agency to individual and collective efficacy" (p. 14). Researchers agree that teacher efficacy is subject to contextual influences that include the school context, subject, group of students, school's organizational structure, and a number of other factors (Ross, Cousins, & Gadalla, 1996; Tschannen-Moran et al. 1998, Tscahnnen-Moran & Woolfolk Hoy, 2006). In addition, efficacy can be significantly impacted by the school organization where shared beliefs and collective experiences come in to play (Hoy & Miskel, 1996; Goddard et al., 2000, 2004).

This stands to reason since any personal agency operates with and within a broad network of influences and other individuals (Bandura, 1997).

A number of studies have attempted to examine the link between school organizations and teacher individual efficacy. Newmann, Rutter, and Smith (1989) considered 10 organizational features and their relation to teacher efficacy. Through an analysis of preexisting data from 353 secondary schools, researchers concluded that the most powerful organizational features were students' orderly behavior, the encouragement of innovation, teachers' knowledge of one another's courses, administrator responsiveness, and help from other teachers. Raudenbush, Rowan, and Cheong (1992) analyzed survey data from teachers in 16 high schools and identified a correlation between elevated self-efficacy and teacher control of working conditions and highly collaborative environments. In their study of 8488 teachers in 354 United States schools, Lee, Dedrick, and Smith (1991) found strong correlations between teacher efficacy and organizational factors that included teacher control, principal leadership, and orderly student environment.

More recently, however, the body of research has shifted away from teachers' *individual* efficacy, and instead, sought to examine organizational influences over teachers' perceived *collective* efficacy. Adams and Forsyth (2006), for example, examined data from 79 Midwestern Schools and determined that the socioeconomic status of students, school level, and school structure all significantly influence teachers' collective efficacy. Knoblauch and Woolfolk Hoy (2008) studied 240 student teachers and concluded that the school setting (i.e. rural, suburban, and urban) greatly influenced perceived collective efficacy. Zambo and Zambo's (2008) work with 63 mathematics teachers suggested that teachers' perception of professional development might influence to teachers' collective efficacy. Bruce et al. (2010) made similar conclusions in

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their analysis of data from two separate school districts. Lee, Zhang, and Yin (2011) concluded that collective learning and faculty trust in colleagues contributed greatly to collective efficacy. Moolenarr, Sleegers, and Daly (2012) analyzed data from 53 Dutch elementary schools and identified a significant correlation between teacher collective efficacy and their collaboration with other educators. In their research with 4165 elementary and secondary teachers, Wahlstrom and Seashore-Louis (2008) identified a significant correlation between teacher collective efficacy and the collaborative, organizational practices of schools.

According to Bandura (1993, 1997) the collective efficacy of teachers varies significantly from school to school. The framework of Social Cognitive Theory explains the basic formation of individual and group perception, but suggests that a number of other influences and circumstances to be explored (Adams & Forsyth, 2006; Brouwers et al., 2011; Pas et al., 2012; Takahashi, 2011). One of these school factors is social persuasion. *Social persuasion* includes verbal persuasion or other suggestive influences offered directly or indirectly to guide performance (Bandura, 1977). Social persuasion entails encouragement or specific performance feedback from a supervisor or colleague and entails discussions in schools, the community, or media about the ability of teachers to influence students (Goddard, et al., 2004). Social persuasion deepens a teacher's confidence, conviction, anxiety, or excitement; in turn, these factors impact teacher efficacy and their expectation of success (Jahnke, 2010; Lashinsky, 2012). Some researchers have suggested that social persuasion may have a stronger role in the formation of collective efficacy beliefs than it has on an individual level (Peltonen, 2008).

Other sources of social persuasion include performance feedback to teachers, professional development opportunities, and school leadership (Goddard, 2001; Goddard et al., 2000; Goddard, Hoy, & Hoy, 2004; Goddard, LoGerfo, & Hoy, 2004). While the predictive

validity of collective efficacy and the impact of social persuasion have been well established in studies (Cohen & Bailey, 1997; Gully et al., 2002; Goddard & Skria, 2006), it is still unclear just how social variables such as performance feedback, school leadership, and professional development affect perceptions of group efficacy in student engagement.

Performance Feedback

In a handful of organizational behavior studies, there exists evidence that collective efficacy beliefs are shaped over time by performance feedback (Gibson & Earley, 2007; Gist & Mitchell, 1992; Lester et al., 2002; Marks et al., 2001; Tasa et al., 2007). *Performance feedback* is the provision of information about individual or group behaviors or skills in order to allow individuals to adjust their performance (Alvero et al., 2001; Gabelica et al., 2012). In such studies, performance feedback is positively associated with collective efficacy (Gully et al., 2002). Feedback is considered a powerful contributor to the development of team performance (Kozlowski & Ilgen, 2006; London & Sessa, 2006). In addition, feedback serves several valuable functions including: guiding current efforts, clarifying desired outcomes and processes, helping to adjust goals and processes, and promoting critical reflection on existing tasks, situations and approaches (Bartram & Roe, 2008). Performance feedback also allows groups to regulate and monitor themselves in order to effectively complete a task (London & Sessa, 2006).

Given the importance of collective efficacy in group performance, a large number of studies in organizational learning have been conducted that have sought to examine the effects of feedback on behavior in work settings (e.g., Alvero, Bucklin, & Austin, 2001; Bartram & Roe, 2008; Boud, 2000; Hattie & Timperly, 2007; London, 2003; London & Sessa, 2006; Reinke, Stormont, Herman, & Newcomer, 2013; Solomon, Klein, & Politylo, 2012). These studies consistently recognize feedback as a means of improving performance and shaping efficacy, but

limit their focus to performance feedback at the individual level (Gabelica et al., 2012). The results of research on individual-level performance feedback, however, cannot simply be generalized to feedback research dealing with groups (Barr & Conlon, 1994; Dewett, 2003).

Collective teacher efficacy is rooted in four sources of information—mastery experience, vicarious experience, affective state, and social persuasion (Bruce et al., 2010; Gist & Mitchel, 1992; Goddard, Hoy, & Hoy, 2000). However, "research exploring the antecedents of collective efficacy has focused almost exclusively on the role of mastery experience," not social persuasion variables (Goncalo, Polman, & Maslach, 2010, p. 14). Though research on the antecedents of collective efficacy is emerging in the field of organizational learning, to date, no studies in have been conducted that examine the influence of performance feedback on teacher collective efficacy in student engagement. Thus far, studies posit that, for teachers, feedback includes guidance from others (e.g. colleagues, department heads, administrators) about the impact of one's behavior on student learning for example, and is aimed at looking critically at assumptions that underlie behavior (Runhaar, Sanders, & Yang, 2010; van Woerkom, 2004). Researchers also suggest that teacher interaction with colleagues or peers in the form of feedback can stimulate individual reflection of teachers (Kohler & Ezell, 1999; Parsons & Stephenson, 2005) and that constructive performance feedback can increase collective efficacy perceptions (Jung & Sosik, 2003). Woolfolk Hoy and Spero (2005) add that positive performance feedback augments individual teacher efficacy and helps teachers surmount occasional setbacks. But a limited amount of information exists in the literature about the influence of performance feedback on collective efficacy in student engagement. Since past research on individual-level performance feedback cannot be generalized to group efficacy, further exploration of the impact of performance feedback on collective efficacy is needed.

School Leadership

School leadership research has recently shown an increased interest in teacher collective efficacy (e.g., Fancera & Bliss, 2011; Kurt, Duyar, & Çalik, 2011; Ross & Gray, 2006; Wahlstrom & Louis, 2008; Ware & Kitsantas, 2007). By *school leadership,* we mean school system leaders who perform administrative decision-making roles in areas such as staffing, training, compliance, and protocol. School leadership includes—but is not limited to—superintendents, assistant superintendents, building principals, assistant principals, and curriculum directors. Increased attention from school leadership regarding collective efficacy makes sense since high levels of collective efficacy result in improved student performance (Goddard et al, 2000), enhanced parent/teacher relationships (Ross & Gray, 2006), and stronger levels of teacher commitment (Mulvey & Klein, 1998). In addition, the positive effects of collective teacher efficacy often outweigh the negative effects of low socioeconomic status (Goddard et al., 2000).

Goddard and Skria (2006) worked with 1,981 K-8 teachers and found that the demographic and contextual factors of schools such as a faculty's experience level, school socioeconomic status, and students' prior academic performance accounted for less than half (46 percent) of the differences between the collective efficacy of schools.   Their findings suggest the existence of a number of other factors that influence collective efficacy that school leadership can influence.

An emerging body of research, though in its early stages, suggests a number of ways in which school leadership influences teacher collective efficacy. For example, the more opportunities afforded by school leadership to teachers to influence instructionally relevant school decisions, "the more likely a school is to be characterized by a robust sense of collective

efficacy" (Goddard et al., 2004, p. 10). In addition, leaders who provide opportunities for staff to focus on instructional practices have an impact on the knowledge and effectiveness of their teachers (Brinson & Steiner, 2007). School leaders also support perceptions of efficacy when they create opportunities for teachers to collaborate and to shares skills and experiences with other teachers (Pfaff, 2000). Supovitz and Christman (2003) posited that schools achieve better results when teachers are provided guidance on ways to investigate the relationships between instructional practices and student work.

A significant body of research suggests a strong link between the transformative capability of school leaders and collective efficacy. Lindsley, Brass, and Thomas (1995) underscore the powerful role that school leaders have helping groups to interpret performance results. School leaders help provide context to results by identifying specific efforts that resulted in success, explaining how the results may or may not indicate success, and presenting outcomes in ways that develop healthy levels of confidence (Lindsley et al., 1995). School leadership can also foster teachers' capacity development and personal commitment to organizational goals (Leithwood & Jantzi, 2005). School leaders affect a group's collective efficacy by raising awareness of individual members' contributions and capacities (Bass & Avolio; 1994; Walumbwa, Wang, Lawler, & Shi, 2004). Ross and Gray (2006) linked school leaders' dedication to organizational growth and the group's collective commitment to the organization and its goals. In short, school leadership can impact collective efficacy by influencing teacher work attitudes and helping them identify with and feel part of the collective mission of the group (Kurt et al., 2011).

Of particular interest in this study was the potential influence that teacher perception of school leadership has on collective efficacy. As of yet, the link between school leadership and

collective efficacy has not been well established (Tschannen-Moran & Hoy, 2001; Wahlstrom & Louis, 2008). Research does suggest that teachers in schools characterized by effective school leadership are more likely than other teachers to exert extra effort and are more likely to be committed to the collective organization and to improving it (Clark, Martorell, & Rockoff, 2009; Leithwood & Jantzi, 2005). Research has repeatedly reported higher teacher efficacy when school leaders are perceived as influential (Goddard & Goddard, 2001; Hoy & Woolfolk, 1993).

In a study of 10 middle schools, Hipp (1996) determined that school leaders affect efficacy by addressing in-school problems such as creating and supporting student discipline policies or enacting structures of school decision making. In their analysis of 26,257 Teacher responses to the national Schools and Staffing Survey, Ware and Kitsantas (2007) also suggested the effect that school leaders have on teacher commitment and efficacy when administrators enforce school rules for conduct. They also developed a construct for gauging teachers' perceptions of and confidence in school leadership. These items provide a means in this study for measuring teacher perception of school leadership (Table 1).

Table 1

Teacher Efficacy to Enlist Administrative Direction (from Ware and Kitsantas, 2007)

1. The principal lets the staff know what is expected of them.
2. The administration's behavior toward the staff is supportive and encouraging.
3. My principal enforces school rules for student conduct and backs me up when I need it.
4. The principal talks with me frequently about my instructional practices.
5. The principal knows what kind of school he or she wants and has communicated it to the staff.
6. In this school, staff members are recognized for a job well done.

Ware and Kitsantas (2007) used exploratory factor analysis to conclude that their school leadership scale "was an indicator of collective efficacy" (Ware & Kitsantas, 2007, p. 307). Limited information, however, is available in the literature on the influence of school leadership on collective efficacy in student engagement.

Professional Development

Professional development is an ongoing need for teachers. By *professional development,* we mean activities and efforts designed to improve educator effectiveness and student learning. These activities include—but are not limited to—courses, workshops, involvement in the production of curricula, and the discussion of assessment data or the sharing of strategies (Avalos, 2011).

There is growing interest in research on the potential effects of professional development on teacher efficacy. Earlier studies have reported increased individual teacher efficacy scores throughout professional development opportunities (Bolinger, 1988; Robardey, Allard, & Brown, 1994), yet such gains tended to dissipate after delivery of professional development ended (Ohmart, 1992). Other studies demonstrate that individual efficacy gains are higher with teachers who more faithfully implement practices derived from professional development (Rimm-Kaufman & Sawyer, 2004; Ross, 1994; Stein & Wang, 1988).

Much of professional development attempts to strengthen teachers' instructional skills. After all, when teachers participate in professional development experiences that lead them to believe that they can master a specific domain, their personal competence level will rise (Bandura, 1997; Schunk et al., 2014). More effective teaching practices that result from professional development are likely to provide teachers with mastery experiences, the strongest predictor of individual efficacy (Ross & Bruce, 2007).

But professional development also affects collective efficacy. One of the main benefits of professional development is the building of collegial relationships, which results in shared responsibility for performance outcomes (Brookhart & Loadman, 1990), increased feelings of effectiveness (Little, 1987), and raised sense of efficacy (Ashton & Webb, 1986; Ross, 1995; Ross, Cousins, & Gadalla, 1996). Professional development opportunities allow teachers to come together and work in teams to stimulate "group thinking" which contributes to collective efficacy (Zambo & Zambo, 2008). Professional development that allows teachers to work and learn together also fosters a sense of collective accountability and fidelity in implementing new practices, resulting in higher teacher efficacy (Fritz et al., 1995; Rimm-Kaufman & Sawyer, 2004).

Some professional development opportunities provide participant interaction (Edwards et al., 1998; Robardey et al., 1994; Ross, 1994), which increase opportunities for observing the success of others and for creating social settings where teachers are persuaded that they will be successful through new teaching strategies (Ross & Bruce, 2007). When professional development provides teachers with shared experiences and time for aligning collective goals, teachers' collective efficacy in their capacity to increase student learning is improved (Moolenaar et al., 2012). While the evidence concerning the influence of professional development on teacher collective efficacy in general is growing, to date, no studies have explored the influence of professional development experiences on collective efficacy in student engagement.

Conclusion

Individual and collective efficacy both impact teachers' ability to influence student engagement and student learning. Collective efficacy stems from the same mastery, social, emotional, and vicarious experiences that influence individual efficacy. While research has given increased attention to collective efficacy, there exists a need to continue to explore the potential influence of social persuasion variables on collective efficacy in student engagement. This study aims to fill the gaps in the literature on the influence of performance feedback, professional development opportunities, and school leadership on collective efficacy in student engagement.

Chapter 3: Methodology

In this chapter, the method employed by the researcher is described. This chapter includes a description of (a) the purpose and research questions**,** (b) the use of extant survey data, (c) analysis of data, and (d) the limitations, and delimitations.

Purpose and Research Questions

The purpose of this quantitative research was to identify and measure the relationships between the social persuasion variables of schools (professional development opportunities, school leadership, and the use of performance feedback) and teacher collective efficacy in student engagement (CESE). The construct of collective efficacy in student engagement (Bandura, 1997; Goddard et al, 2000) provided the primary means used to examine teachers' collective efficacy in student engagement.   Secondary data analysis of the Teacher Working Conditions Survey (TWCS) of 2009 was conducted. The findings in this study may advance the current understanding of CESE and help to identify school level factors that improve teachers' ability to engage students. This study investigated the following research questions:

RQ1: Is collective efficacy in student engagement (CESE) positively correlated with perception of the use of performance feedback (PPF)?

$H1_0$: There is no positive relationship between the use of performance feedback and teachers' collective efficacy in student engagement.

$H1_A$: There is a significant positive relationship between the use of performance feedback and teachers' collective efficacy in student engagement.

RQ2: Is collective efficacy in student engagement (CESE) positively correlated with perception of professional development opportunities (PPDO)?

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$H2_0$: There is no positive relationship between perception of professional development opportunities and teachers' collective efficacy in student engagement.

$H2_A$: There is a significant positive relationship between perception of professional development opportunities and teachers' collective efficacy in student engagement.

RQ3: Is collective efficacy in student engagement (CESE) positively correlated with perception of school leadership (PSL)?

$H3_0$: There is no positive relationship between perception of school leadership and teachers' collective efficacy in student engagement.

$H3_A$: There is a significant positive relationship between perception of school leadership and teachers' collective efficacy in student engagement.

RQ4: Can a combination of the social persuasion variables of perception of the use of performance feedback (PPF), perception of professional development opportunities (PPDO), and perception of school leadership predict scores on collective efficacy in student engagement (CESE)?

$H4_o$: Combined, the variables cannot predict a CESE score.

$H4_A$: Combined, the variables can predict a CESE score.

The Use of Extant Survey Data

This section provides an overview of the use of extant survey data in the study including (a) the Measures of Effective Teaching Project, (b) the Teacher Working Conditions Survey, (c) the use of extant data in this research.

The Measures of Effective Teaching Project

The Measures of Effective Teaching Project (MET) was one of the largest education studies conducted in the United States (Bill and Melinda Gates Foundation, 2013). The project was funded and supported by a grant from the Bill and Melinda Gates Foundation.   Researchers collected a variety of indicators of teaching quality over a two-year period (annual year 2009-2010 and annual year 2010-2011) in the classrooms of more than 2500 fourth- through ninth-grade teachers (Bill and Melinda Gates Foundation, 2013). Teachers were from 317 schools located in six large school districts in the United States. These school districts include Charlotte-Mecklenburg Schools, the Dallas Independent Schools, the Denver Public Schools, the Hillsborough County Public Schools, the New York City Schools, the Memphis Public Schools, and the Pittsburgh Public Schools.

Data collected on teachers and their teaching included measures of students' achievement in each teacher's classroom drawn from state-administered assessments and supplemental achievement tests; surveys of students in each teacher's classes; video-recorded lessons taught by teachers and scored by independent observers using multiple classroom observation protocols; assessments of each teacher's pedagogical and content knowledge for teaching; and two different teacher surveys (Bill and Melinda Gates Foundation, 2013). In addition, principals of the schools where teachers worked also completed a survey and other administrative data on schools, teachers, and students are available for analysis (Bill and Melinda Gates Foundation, 2013).

During the 2009-2010 school year, the MET Study studied the intact classes of participating teachers then randomly assigned teachers to classes of students in the 2010- 2011 school year. The 2009-2010 study of intact classrooms was intended to construct measures of teaching effectiveness, to assessing the psychometric properties of various measures of teaching

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effectiveness, and to using correlational methods to assess empirical relationships among measures (Bill and Melinda Gates Foundation, 2013). The second-year (or randomization) portion of the study was designed to make causal inferences about relationships among indicators of teaching quality. As a result, MET collected much of the same data on teachers as in Year One.

The Teacher Working Conditions Survey

The Teacher Working Conditions Survey (TWCS) being used as the source of extant data for this study was a stand-alone component of a larger study through the Measures of Effective Teaching (MET) project conducted over a two-year period (annual year 2009-2010 and annual year 2010-2011).   Measures of Effective Teaching (MET) researchers administered the TWCS survey to all teachers at MET schools during the first year of the project. The survey consisted of more than 200 items that asked teachers to assess the quality and the characteristics of school life and the availability of supports for improved teaching and learning (Clifford, Menon, Gangi, Condon, & Hornung, 2012).

Survey items were the result of recent research conducted by Ladd (2009) which suggested that understanding and improving teaching conditions can result in stronger teacher recruitment programs, improved teacher motivation, enhanced teacher retention, and, ultimately, increased student achievement. The survey was piloted in 2002 with teachers in North Carolina and has since been adapted and administered in over ten states. A copy of the questionnaire is available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34345.

Specifically, the TWCS asked teachers to report on the quality of school facilities and availability of resources to support instruction; opportunities for professional development and the quality of that professional development; support to help teachers analyze student data and

collaborate to improve instruction; support given to teachers in managing student behavior; the degree of teacher leadership present at the school; trust of leadership and the level of support received from school leadership; and the level of parent and community involvement (Bill and Melinda Gates Foundation, 2013). The TWCS was administered through a confidential online system with teachers receiving their access codes from teacher representatives within each school.   Due to the "nature of the data collected, teacher responses were only linked to the teacher's school" (Bill and Melinda Gates Foundation, 2013, p. 36). Teachers were able to self-identify at MET study sites and provide their MET Identification Number (ID).

The data were compiled by the University of Michigan and housed in the Interuniversity Consortium for Political and Social Research (ICPSR) data system. ICPSR data undergo a confidentiality review and are altered when necessary to limit the risk of disclosure. In addition to these procedures, ICPSR perform consistency checks, create variable/value labels, and check for undocumented or out-of-range codes. The Measures of Effective Teaching Longitudinal Database (METLB) is restricted from general dissemination and can only be accessed by researchers approved by ICPSR to do so. Once approved for use of the confidential data, researchers are granted a secure login in order to access ICPSR's Virtual Data Enclave (VDE).

Other organizations such as the New Teacher Center (NTC) continue to use the TWCS in their efforts to explore the connections between the presence of positive teaching environments and other variables such as student achievement and teacher retention. This includes specific analyses for subsets of schools or educators.

Teacher working conditions sampling. The Teacher Working Conditions Survey utilized a process of "opportunity" sampling that occurred between July and November 2009. This sampling resulted in teachers from large, urban school districts volunteering to participate in

the study. The process of opportunistic sampling then continued as elementary, middle, and high schools within each district were recruited into the study. Once schools were recruited, opportunity sampling continued as teachers (at targeted grade levels and subject areas) within these schools volunteered for the study. In participating schools, teachers who were part of the study received a $1500 incentive for participating ($1000 at the beginning and $500 at the end of the study). Additionally, the districts were awarded small budgets to provide thank you gifts for teachers that participated. This sampling process resulted in 2,741 teachers from 317 schools in six large school districts being recruited into the first year of the study (AY 2009-2010).

Teacher working conditions survey reliability and validity. Reliability is defined as the "consistency with which a test measures whatever it's measuring" (Popham, 2013, p. 61). When measuring school climate, instrumentation should consistently produce similar results as long as the school climate and the survey respondents have not changed (Clifford et al., 2012). Evidence for a survey instrument's reliability includes stability and internal consistency. Stability refers to the consistency of results from the assessment from different testing situations (Popham, 2013). A reliable survey is generalizable and therefor is expected to reproduce similar results across settings. Validity, on the other hand, refers to the extent to which an instrument measures what it is intended to measure, and consists of both construct and content validity. Construct validity is an instrument's ability to measure the proposed variables or constructs. Content validity refers to the degree to which survey items reflect the components of a domain or construct.

Teacher working conditions survey reliability. According to documentation provided by ICPSR and the New Teacher Center, external measures have been taken to ensure that results from the survey instrument are generalizable and that the instruments reproduces similar results

across settings. An external review analyzed the reliability of the TWCS using both the Rasch model person separation reliability and Cronbach's alpha. Swanlund (2011) examined the TWCS and concluded that the survey is capable of producing consistent results across participant groups. Swanlund (2011) also concluded that the survey offers a robust and statistically sound approach for measuring teaching and learning conditions. Similarly, in their review of various school climate instruments, Clifford et al. (2012) also examined the survey for reliability. They reported reliability coefficients for subscales ranging from .80 to .98 and an average subscale reliability of .91 (Clifford, et al., 2012).

   Teacher working conditions validity. Concerning validity, Clifford et al. (2012) reported that the TWCS' content validity was "established through an extensive literature review, item-measure correlations, and the fit of items to model expectations" and that validity was further "established via Rasch analysis" (Clifford et al., 2012, p. 19). The TWCS was based on past iterations of the survey first developed in North Carolina. Early drafts of TWCS were created in 2001 by the North Carolina Professional Teaching Standards Commission (NCPTSC) who completed a literature review of the role of working conditions on teacher dissatisfaction and teacher mobility. The work was spurred by state and national survey data from the National Center for Education Statistics' School and Staffing Survey and focused on teacher identified areas and conditions that drove their satisfaction and employment decisions. Areas identified by teachers included administrative support, autonomy in making decisions, school safety, class size, and time. The NCPTSC eventually placed identified working conditions into five areas that included time, empowerment, leadership, facilities, and resources.

   In 2004, the drafted survey was expanded from a 39-question paper/pencil survey on a 1-to-6 scale to a 72-question online survey. Many of the items were "reality" questions, or drawn

from the National Center for Education Statistics School and Staffing Survey to determine if teachers' reporting of issues such as non-instructional time and professional development received had an impact on their perceptions of whether supportive working conditions were in place (Moir, 2009). In 2004, a sample of educators examined the survey instrument and used an ordinal scale to rank the relevance and importance of each question. Questions were then compared to the factor analyses to verify the importance of a set of critical conditions in each area of the survey (Moir, 2009). The questions rated as most important with the highest factor loads made up the battery of core questions on the 2008 TWCS. Correlations were also run between the perceptual and "reality" questions on the survey. Through this extensive process, "feedback on the wording of the questions and other areas to assess has been gathered and utilized to improve the survey instrument" (Moir, 2009).

Additional survey constructs were added in recent versions of the TWCS that to address conditions related to Managing Student Conduct, Community Support and Involvement, and Instructional Practices and Support. The inclusion of these additional constructs provided a more detailed and nuanced lens for examining school working conditions. Additionally, response options were changed to a 4-point scale (Strongly disagree, Disagree, Agree, Strongly agree) and included a "Don't Know" option.

The TWCS survey consisted of eight constructs that included time, facilities and resources, community support and involvement, managing student conduct, teacher leadership, school leadership, professional development, and instructional practices and support. Survey validity and reliability were established through prior use and factor analysis of the studies. To assess the degree to which the survey measures the eight theoretical constructs on which it is designed, confirmatory and exploratory factor analyses on the data were conducted (New

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Teacher Center, 2011). Using a principal components analysis and varimax rotation procedures, eigenvalues of one or greater were used as the criteria for factor extraction (Moir, 2009). In the subsequent versions of the TWCS, a nine-factor model accounted for the greatest proportion in the total variance (multiple factor models were attempted), suggesting that there are nine distinct concepts within the survey. These nine concepts included the eight previously used constructs and added new teacher support as an additional construct. Assessing each construct as originally developed, TWCS developers identified the questions that load most strongly for each construct and thus are most representative of that construct (New Teacher Center, 2011).

The Use of Extant Data in This Research

Data from the Teacher Working Conditions Survey (TWCS) was chosen to help answer the research questions. The survey had more than 200 items asking teachers to report on different features of their school, using many items borrowed from previous school surveys conducted around the United States. While the TWCS was designed to examine organizational features and levels of support in their school environments, it included several items dealing with collective efficacy and the school social influences such as: school use of performance feedback, professional development opportunities, and school leadership.

In order to run statistical analysis of TWCS data, it was necessary to seek and obtain access. Measures of Effective Teaching Longitudinal Database (METLB) data is restricted from general dissemination and can only be accessed by researchers approved by ICPSR to do so. Access to TWCS quantitative data files was obtained via application to the restricted METLB. Research approval was first sought and obtained from Kansas State University IRB committee. IRB approval documentation was then submitted to METLB in conjunctions with (1) the METLDB Confidential Data Use Agreement, (2) the Confidential Data Security Plan, and (3) an

access fee of 500 dollars. Once this application process was completed, approval was granted by METLB for use of the confidential data along with a secure login permitting access ICPSR's Virtual Data Enclave (VDE). The VDE served as virtual machine launched from the researcher's own desktop and operated on a remote server in order to restrict external data and to prevent movement files outside of the secure environment.

Selection of independent variables. Based on the research questions and a review of the literature on teacher efficacy, collective efficacy, and collective efficacy in student engagement, three independent variables and one dependent variable were identified.   Independent variables focused on the socially persuasive elements of schools and included perception of the use of performance feedback in schools (PPF), perception of professional development opportunities (PPDO), and perception of school leadership (PSL). The dependent variable identified was collective efficacy in student engagement (CESE). A description of the dependent and independent variable scales examined in this research along with corresponding codes and survey items can be found in the Appendix A. A list of all variables initially examined in Appendix B.

Collective Efficacy in Student Engagement (CESE) scale

In the past, one recommendation for measuring collective efficacy perceptions has been to explore ways to which we might aggregate measures of individual perceptions of group-referent capabilities (Goddard et al., 2004). Unlike measures of *self*-efficacy that focus on the participant's perception of themselves as an individual, collective efficacy surveys would instead refer to the object of efficacy perception as "we" instead of "I." For example, a collective efficacy survey item might read, "In our school, teachers have what it takes to educate our students." Responses to this and other similar questions could be averaged to assess perceived

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collective efficacy (Goddard et al., 2004), but also could be used to examine the possible influence that school practices and working conditions might have on perceived collective efficacy.

The TWCS used by the Measures of Effective Teaching project utilized several such questions that allowed teachers to report their perception of several the capabilities and levels support in their school environment. Of particular interest for this research are items dealing with teacher confidence in their school's ability to motivate and engage students, perception of professional development, the use feedback, and perception of school leadership.

In order to increase specificity, Tschannen-Moran and Woolfolk Hoy's (2001) exploratory factor analysis identified of three dimensions of teacher efficacy: Instructional Strategies, Instructional Management, and Student Engagement. This study was only concerned with the last component, and therefore only a Collective Efficacy in Student Engagement Scale (CESE) was used. Such an approach has also been utilized by Martin, Sass, and Schmitt (2012) in their exploration of the relationship between teachers' efficacy in student engagement and teachers' intent to leave, and makes conceptual sense when there exists a specific research in student engagement. In this study, a CESE subscale will be used to explore the relationship between teacher collective efficacy and the contextual influences of schools. Both Tschannen-Moran et al. (2001) and Martin et al. (2012) employed a Student Engagement construct that utilized eight items and reported alpha coefficients in the low 0.80s and low .90s respectively.

For this research, the outcome variable was based on responses to the TWCS that employed the same Collective Efficacy Scale (CE-Scale) utilized by Goddard, Hoy, and Woolfolk Hoy (2004) and Moolenaar, Sleegers, and Daly (2012). A continuous, composite variable was created by computing the mean of five selected survey items. The scale was

composed of five Likert-type items where teachers describe their extent of agreement with each item from strongly disagree to strongly agree along a 4-point scale.

In this study, the items were employed to establish a Collective Efficacy in Student Engagement (CESE) scale, as well as a CESE score for each teacher. The similarities between the CESE scale employed for this study and the CE-Scale used by other researchers can be observed in Table 2. Cronbach's Alpha, or Alpha coefficient ranges in value from 0 to 1 are used to describe the reliability of factors extracted from scaled scores. The higher the score, the more reliable the generated scale is. A Cronbach's Alpha value of 0.7 is to considered to be an acceptable reliability coefficient, but lower thresholds are sometimes used in the literature (DeVellis, 2011; Santos,1999; Tavakol & Dennick, 2011). Using reliability testing in SPSS, the CESE scale was determined to have a Cronbach's Alpha coefficient of .875, which was greater than .7 and therefore considered acceptable (Bandalos & Finney, 2010). This high degree of reliability helps provide support of the validity of the construct.

Table 2

Collective Efficacy Scale Items

Collective Efficacy Scale (CE-Scale) items from Goddard et al. (2004) and Moolenaar et al. (2012)	Collective Efficacy in Student Engagement (CESE) Scale drawn from the Teacher Working Conditions Survey (2009)
1. In this school, teachers are able to motivate their students.	1. Teachers are confident they can motivate students.
2. In this school, teachers are able to challenge their students to learn.	2. Teachers in my school have what it takes to get the children to learn.
3. In this school, teachers in this school are able to get through to difficult students.	3. Teachers in this school are able to get through to difficult students.
4. The teachers in this school really believe every child can learn.	4. Teachers in my school really believe that every child can learn.
5. In this school, if a child doesn't want to learn teachers here give up (reversed).	5. If a child doesn't want to learn, something the first time, teachers here will try another way.

Social persuasion variables. Predictor variables in this study consisted of school social persuasion variables (the use of performance feedback, professional development opportunities,

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and school leadership). In order to gauge teachers' perception of each of the social persuasion variables in their school, a scaled score of participant responses from other sections of the TWCS was utilized. Like the items selected for the CESE scale, the items on school social persuasion variables asked participants to describe their extent of agreement with each item from strongly disagree to strongly agree along a 4-point scale. Take for example the following sample items:

- Professional Development Opportunities: "Professional development enhances teachers' abilities to improve student learning."

- School Leadership: "The school leadership consistently supports teachers."

- Performance Feedback: "Teachers receive feedback that can help them improve teaching."

Perception of school leadership (PSL) scale. The first predictor variable was teacher Perception of School Leadership. The scale was operationalized using an adaption of items from earlier research dealing with teacher perception of school leadership. Ware and Kitsantas (2007) sought to measure the extent to which educators' believe that their administrator's behavior supported their work and utilized "six scale items addressed the (a) principals' communication of expectations, (b) belief that the school administration was supportive of the staff, (c) principals' enforcement of rules for conduct, and (d) staff recognition for work well done" (p. 305).

In this study, each respondent's PSL score was the result of their responses to TWCS items that corresponded closely with Ware and Kitsantas' (2007) earlier work dealing with teacher perception of school leadership. Computing the mean of selected survey items created a continuous, composite variable. Items from the Ware and Kitsantas (2007) instrument along with corresponding items from the TWCS can be seen in Table 3. The PSL scale had a

Cronbach's Alpha coefficient of .898, which was greater than .7 and therefore considered

acceptable (Bandalos & Finney, 2010).

Table 3
Perception of School Leadership Items

Teacher Efficacy in School Leadership from Ware and Kitsantas (2007)	Corresponding Item in the Perception of School Leadership (PSL) scale drawn from the Teacher Working Conditions Survey (2009)
1. The principal lets the staff know what is expected of them.	1. The faculty and leadership have a shared vision.
2. The administration's behavior toward the staff is supportive and encouraging.	2. The school leadership consistently supports teachers.
3. My principal enforces school rules for student conduct and backs me up when I need it.	3. The school leadership makes a sustained effort to address teacher concerns about managing student conduct.
4. The principal talks with me frequently about my instructional practices.	No corresponding item, but item 6 deals with instructional practices.
5. The principal knows what kind of school he or she wants and has communicated it to the staff.	4. No corresponding item in the Teacher Working Conditions Study, but similar to Item 1--'The faculty and leadership have a shared vision."
6. In this school, staff members are recognized for a job well done.	5. The faculty are recognized for accomplishments.
No directly corresponding item, but similar to item 4 of Ware and Kitsantas (2007) that deals with instructional practices.	6. Teachers are held to high professional standards for delivering instruction.

P*erception of performance feedback (PPF) scale.* The second predictor variable was

teacher Perception of Performance Feedback. In this study, each respondent's PPF score was the

result of their responses to the TWCS items focused on teacher's perceptions of the use

performance feedback. Items were included in the PPF scale based on the literature regarding

performance feedback. *Performance feedback* is defined as the provision of information about

individual or group behaviors or skills in order to allow individuals to adjust their performance

(Alvero, Bucklin, & Austin, 2001; Gabelica, Bossche, Segers, & Gijselaers, 2012). As a result,

three items were selected for the PPF scale (Table 4). The first two items, (1) objective

assessment of teacher performance and (2) the use of feedback to help educators improve their teaching, both dealt closely with the definition of performance feedback by Alvero et al. (2001) and Gabelica et al. (2012). One additional item was also selected from the TWCS that dealt with the use of data to improve student learning. This seemed appropriate since student learning is often considered a key indicator of teacher performance (Darling-Hammond, 1999; Darling-Hammond, Amrein-Beardsley, Haertel, & Rothstein, 2012).

Table 4

Perception of Performance Feedback Items

1. Teacher performance is assessed objectively.
2. Teachers receive feedback that can help them improve teaching.
3. The school leadership facilitates using data to improve student learning.

A continuous, composite variable was created by computing the mean of respondents' answers to items selected to make up the PPF scale. Using reliability testing, the PPF scale was determined to have a Cronbach's Alpha coefficient of .800, which was greater than .7 and therefore considered acceptable (Bandalos & Finney, 2010).

Perception of professional development opportunities (PPDO) scale. The final predictor variable was teacher Perception of Professional Development Opportunities. As was the case with other predictor variables in the study, computing the mean of selected survey items created a continuous, composite variable. In this study, each respondent's PPDO score was the result of their responses to 11 items utilized repeatedly in past working conditions surveys (Swanlund, 2011). These items focused on teacher's perceptions of professional development opportunities (Table 5). Using reliability testing, the PPDO scale was determined to have a

Cronbach's Alpha coefficient of .949, which was greater than .7 and therefore considered

acceptable (Bandalos & Finney, 2010).

Table 5

Perception of Professional Development Opportunities

1. Professional learning opportunities are aligned with the school's improvement plan.
2. Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.
3. Professional development deepens teachers' content knowledge.
4. Professional development is differentiated to meet the needs of individual teachers.
5. Professional development enhances teachers' abilities to improve student learning.
6. Professional development is evaluated and results are communicated to teachers
7.   In this school, follow up is provided from professional development.
8.   Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.
9.   Teachers are encouraged to reflect on their own practice.
10. Sufficient resources are available for professional development in my school.
11. An appropriate amount of time is provided for professional development.

Analysis of Data

This section provides an overview of the data cleaning and statistical analyses involved in the research. It includes information on data cleaning, statistical analysis, and testing of assumptions.

Data Cleaning

ICPSR initially provided TWCS responses to the collective efficacy in student engagement (CESE) scale for 4,946 educators. Since CESE is an aggregate of measures of individual perceptions of group-referent capabilities (Goddard et al., 2004), and since respondents were clustered by school districts, there existed a need to account for the clustering of teacher respondents in their respective school districts. However, TWCS respondents were not required to enter district identification numbers when completing the survey, but were granted the option of self-identifying with district identification numbers at MET study sites. Subsequently, the district identifier was missing from 84% of cases that were omitted from analysis. As a result, the number of cases analyzed was reduced to 262 cases, all of which were from a single urban school district. Despite a significant reduction in the sample size, Klassen, Usher, and Bong (2010) insist that a subsample from a single school district is still likely to provide insight into collective efficacy since educators form efficacy beliefs about the collective capabilities of the groups to which they belong.

The remaining 262 data cases were further examined for missing values and accuracy. Data cleaning was done manually in SPSS. Survey items selected for the independent and dependent variable scales asked participants to describe their extent of agreement with each item from strongly disagree to strongly agree along a 4-point scale. Participant responses in the survey of 'don't know' had been previously coded by ICPSR with a value of 5 on a 4-point

scale. As a result, 'don't know' responses were recoded to 'missing' to avoid skewing the

numeric value that would be later computed from the continuous, composite variable derived

from the from the items on each scale. Cases with two or more missing responses to scaled items

were manually deleted. This data cleaning resulted in a further reduction of the sample size from

262 cases to 260.

In remaining cases with any missing data values, Multiple Imputation was utilized.

Unlike Listwise Deletion or other traditional approaches to missing data which can result in

significant loss of data, *Multiple Imputation* prevents any further reduction of sample size and

preserves unbiased estimates of population parameters by creating multiple data sets that replace

each missing value with two or more plausible values (Acock, 2006; Rubin, 2004). Compared to

more traditional approaches used to deal with missing data, multiple imputation also preserves

statistical power and achieves more stable estimates (Rubin, 2004). Using statistical software,

missing data are analyzed for potential patterns. Five to ten new data sets are created then using

data augmentation (Acock, 2006). New values are inserted into each augmented data set that

"represent the uncertainty about the right value to impute" (Yuan, 2010, p. 1). Then, models are

run for each of the augmented data sets so that pooled estimates of the parameters and standard

errors can be calculated (Acock, 2006; Rubin, 1996, 2004).

Statistical Analyses

For remaining 260 cases, descriptive statistics were calculated that included the means,

standard deviations, and zero order correlations for each of the indicators. The coefficient alphas

for each scale were also calculated. Correlation and multiple regression analysis were used in

order to assess the relationship between one dependent variable and multiple independent

variables. Correlation allowed the measurement for the direction and magnitude of the linear

relationship between variables. Correlation analysis produces a correlation coefficient that ranges between -1 to 1. The closer the correlation coefficient is to positive or negative 1, the stronger the relationship between the variables.

Multiple regression statistics were also used to assess the relationship between the dependent variable and the three independent variables. The calculation of regression coefficients was conducted in SPSS. Multiple regression analysis was also used to determine if a combination of the independent variables could be utilized to predict a teacher's scores on the dependent variable, and which independent variables have the most influence on the dependent variable.

SPSS can be used to find the relationship of multiple independent variables between a single dependent variable. Multiple regression procedures determine a best fit line (Hair, Black, Babin, & Anderson, 2014). The form of this equation is $y=a+b_1*x_1+b_2*x_2+b_3*x_3$ where a where represents the constant, or y-intercept, and is the value on the y-axis where the regression line intersects the y-axis. The letter b denotes the B coefficient (Hair et al., 2014). This equation, or model, predicts values of the dependent variable. The letters x_1, x_2, and x_3 represent the independent variables. Once these values are placed into the equation, the predicted value of the dependent variable, represented by Y, can be calculated (Hill & Lewicki, 2007).

In a regression model, the B coefficient indicates the unique contribution of each independent variable to the dependent variable. When the B coefficient is expressed in a standardized unit, it is called a called a beta weight (Ott & Longnecker, 2010). The standardization of beta allows for a comparison of the relative influence of independent variables that have may different units of measurement and allows us to assess the direction of influence of each independent variable on the dependent variable (Field, 2009).

How well the regression line fits the data helps to determine the quality of the regression line. Multiple regression analysis accuracy is dependent on the predictive value of the linear regression model. The coefficient of multiple determination, R-squared, measures the percentage of variance in the dependent variable that is explained by the independent variables. To calculate R-squared, the residual values, or deviation of the data points from the regression line, are determined (Hair et. al 2014). The smaller the residual values, the closer the data points are to the regression line and the more accurately the model is able to predict the outcome of the dependent variable.

R-squared ranges in value from zero to one. The closer R-squared is to 1.0 the better the prediction model (Hill & Lewicki, 2007). R-squared is 1.0 minus the ratio of the residual values (Hill & Lewicki, 2007). If there is no relationship between the independent variables and the dependent variables, the ratio of residual values equals 1.0 and R-squared equals 0.0. If the data points lie perfectly on the regression line, then there is no un-explained variance and R-squared equals 1.0.

Once R-square is calculated, the multiple correlation coefficient, R, can also be calculated. The correlation coefficient is the square root of the coefficient of multiple determination, R-squared, and expresses the relationship of multiple independent variables to a single dependent variable (Field, 2009; Ott & Longnecker, 2010). The closer R is to 1.0 the better the correlation. The directionality of each independent variable's relationship to the dependent variable is indicated by the sign of each independent variable's beta weight (Hill & Lewicki, 2007).

In summary, multiple regression was used to examine the relationship between multiple, independent social persuasion variables (PSL, PPDO, and PPF) to a single, dependent variable

(CESE). Multiple regression was also used measure the relative influence of each of the

independent variables and to create a model for prediction of the outcome of the dependent

variable.

Question 1. The first research question asked if collective efficacy in student engagement

(CESE) is positively correlated with perception of the use of performance feedback (PPF). To

examine the relationship between IVs and the DV, bivariate correlations were run in SPSS.

Correlation coefficients for each independent variable (PSL, PPD, PPF) with the

dependent variable (CESE) were then examined for significance. For this question, correlation

coefficients were expected between zero and positive 1. The closer the correlation coefficient is

to positive or negative 1, the stronger the relationship between the variables. Values of $+ .1$

represent a small positive effect, $+.3$ represent a medium effect, and $+.5$ is a large effect (Cohen,

Cohen, West, & Aiken, 2003).

Question 2. The second research question asked if collective efficacy in student engagement

(CESE) is positively correlated with perception of professional development opportunities

(PPDO). The same procedure that was used to answer Question 1 was employed.

Question 3. The third research question asked if collective efficacy in student engagement

(CESE) is correlated with perception of school leadership (PSL).   The same procedure that was

used to answer Questions 1 and 2 was employed.

Question 4. The fourth research question asked if a combination of the social persuasion

variables of PPF, PPDO, and PSL could be used to predict scores for collective efficacy in

student engagement (CESE). Multiple regression analysis was used to determine the relationship

between several independent variables and the dependent variable. Regression analysis allows

the researcher to determine if the set of predictors can predict the outcome and which predictors

contribute most to the model's ability to predict the outcome. Once significantly contributing variables have been identified, analysis is rerun including only the important predictors.

Multiple regression statistics were run in SPSS to calculate regression coefficients. In order to assess how well the model fits the data, *Multiple R*, R^2 Coefficient of Determination, and an overall F-test were used. An F-test provides and indication of the joint significance of the predictor variables on the outcome variable and helps the researcher answer the question of whether the predictor variables can predict the outcome variable. The value of R indicates the degree of correlation between observed values of *Y* and the values predicted by the model. Larger values of *R* and R^2 indicate higher degrees of correlation between predicted and observed values.

Testing of Assumptions

In order to draw conclusions about a population using regression analysis, the assumptions of multiple regression must hold true (Berry, 1993; Tabachnick & Fidell, 2014). As part of analysis, steps were taken to ensure that the assumptions of multiple regression (i.e., linearity, normality of residuals, homoscedasticity, and independence of residuals) were met (Tabachnick & Fidell, 2014). By *linearity*, we mean that the relationship between each predictor variable and the outcome variable is linear. The assumption of linearity indicates that values of the outcome variable, when plotted against the predictors, lie along a straight line. Linearity is assessed by plotting the observed versus the predicted values or a plot of residuals versus predicted values.

Normality of residuals refers to the assumption that residuals, or errors, are normally distributed. In multiple regression, it is assumed that residuals are random, normally distributed variables with a mean of 0 (Berry, 1993; Hair et. al 2014). This assumption indicates that the

differences between the observed data and the model are most frequently zero, or very close to zero, and that differences much greater than zero happen only occasionally (Cohen, Cohen, West, & Aiken, 2003). Normality of residuals is assessed by examining a histogram and the p-p plot. This allows the researcher to verify that most of predicted values are close to the observed values and that about the same number of occurrences of the prediction are higher or lower than the residuals. An abnormal plot indicates that the model is either over or underestimating the observed value more frequently than it should be.

The assumption of *homoscedasticity* refers to whether or not the residual error, or variance is constant across predicted values of the dependent variable. In other words, at each level of the predictor variable, the variance of residual terms should be constant. The assumption is tested by plotting the standardized predicted values of the dependent variable (ZPRED) and the studentized deleted residuals (SDRESID) to see if the sizes of the residuals are roughly the same.

Independence of residuals refers to whether or not the residuals, or errors, are correlated. This is assessed through the use of a Durbin-Watson test. The test statistic can value between zero and four. A value of two indicates that residuals are uncorrelated, whereas a value below or above two indicates positive or negative correlation respectively. As a rule of thumb, values of less than 1 or greater 3 are considered a cause for concern (Berry, 1993; Field, 2009).

Steps were also taken to check the data for the influence of outliers. *Outliers* refer to extreme values that may have undue influence on the regression line (Rousseeuw & Leroy, 2005; Tabachnick & Fidell, 2014). They can also result in biased statistics, such as the mean. A number of techniques exist to identify outliers and their effects. A leverage statistic (h) is calculated to gauge how much the value of the predictor variable is different from the mean of

predictor variable. Leverage can have values from 0 to 1. If leverage is less than .2, the point is not a problem, whereas leverage values over .5 represent cases that have undue influence (Tabachnick & Fidell, 2014). Cook's distance (D) measures the effect of deleting a particular observation on the model. Observations with larger D values than the rest of the data are those which have unusual leverage. When $D > 1$, there exists an indication of an outlier problem. Dfbetas are used to determine how much each regression coefficient might change if a point is removed from a model. When the absolute value of dfbeta is greater than 2, it indicates an overly influential outlier. Finally, studentized residuals provide a t-statistic for the residual. If the value of the studentized residual is greater than two, it indicates and overly influential outlier.

Finally, steps were taken to detect significant *multicollinearity,* or intercorrelation between the independent variables. When independent variables are multicollinear, they cannot be predictors in the same model. In order to detect multicollinearity, tolerance, variance-inflation factor, and condition indices are utilized. Tolerance measures the percent of variance in the predictor that cannot be explained by the other predictors. When the tolerance value is less than .2, there is an indication of significant multicollinearity, because nearly all the variance in the predictor variable can be explained by another predictor. Variance-inflation factor (VIF) is the reciprocal of tolerance. When VIF is greater than 4, multicollinearity is a problem. A high VIF value indicates that a high amount of variance in a predictor variable is explained by another predictor variable. Condition indices are variance proportions that allow the researcher to identify collinearity when two or more variables are have large portions (.50 or more) of variance that correspond to a large condition. A rule of thumb is to label as large those condition indices in the range of 30 or larger (Tabachnick & Fidell, 2014).

Limitations and Delimitations

Researchers recognize prospective flaws or problems in quantitative research called limitations and delimitations (Johnson & Christensen, 2010; Locke, Spirduso, & Silverman, 2007). *Limitations* are factors of the study that impact the researcher's ability to establish a direct relationship between the independent and dependent variables, or that threaten internal validity (Gall, Gall, & Borg, 2007). In contrast, *delimitations* are factors within the researcher's control that likely affect the external validity of the study, or the generalizability of results to a larger population.

Limitations

One limitation in this study is due to sampling. This study focused on a sample of teachers from a single, urban school district that participated in the MET project. Therefore, generalizations are limited to similar populations.

Based on the literature, another limitation of the study has to do with potential problems of survey respondents self-reporting. Self-report surveys like the TWCS utilize a Likert format. This format has "been criticized for conceptually inaccurate scoring formats, resulting in imprecision in interpretation" (Fulmer & Frijters, 2009, p. 227). In addition, "responses to self-report measures are, theoretically, susceptible to systematic influences from various types of extraneous variables associated with these processes" (Chan, 2009, p. 314). In this research, where the intent is to examine the socially influential variables of schools, it is possible that other systematic influences are at work.

Another problematic feature of self-report is *common method variance*, occurs when multiple measures come from the same source, resulting in possibly inflated correlations (Podsakoff & Organ, 1986). "The basic idea is that the relationship between constructs measured

using the same method (e.g., self reports) may be biased due to shared variance attributable to the same method effect" (Chan, 2009, p. 311).

Another limitation has to do with the voluntary nature of the study. The Teacher Working Conditions Survey utilized a process of "opportunity" sampling that occurred between July and November 2009. It is possible that the participants who volunteered do not necessarily constitute a sample representative of the entire school or school district from which they came. Instead, they might be more confident in their abilities and may, in turn, report higher collective efficacy than other, less confident teachers not participating in the study. Thus, the process of opportunity sampling utilized in the TWCS increases the likelihood of sampling error and non-coverage error, further limiting the generalizability of the results (Dillman, & Groves, 2011).

Another limitation to the generalizability of this study is due to missing data. A large number of ICPSR district identifiers (84%) were missing. As a result, a subsample of 262 cases from a single district was analyzed. In addition, response rates were not reported in any part of the Measures of Effective Teaching documentation, so non-response error is also a possibility. Since those who voluntarily participated in the survey might have responded differently from those who did not volunteer, the generalizability of results might be further limited.

Delimitations

This study sought to examine the relationship between the independent variables of perception of school leadership (PSL), perception of professional development opportunities (PPDO), and perception of the use of performance feedback (PPF) on the dependent variable of collective efficacy in student engagement (CESE). To do so, a quantitative, multiple regression approach was taken. While regression analyses reveal potential relationships among variables, it

doesn't indicate causality. Therefore, any discoveries in this research are limited to associative

relationships, and therefore neither indicate nor imply causality.

One possible delimitation was the use of Multiple Inputation to deal with missing data.

While Multiple Imputation has been shown repeatedly to be a powerful tool for preventing

reduction of sample size and preserving unbiased estimates, it can also be potentially problematic

when *don't know* responses cannot be interpreted as part of a continuum between agree and

disagree (Acock, 2006). In this research, a *don't know* response was difficult to place on a

numeric scale due its appearance at the end of survey items. Rather than being placed on the

continuum as a neutral response (i.e., 3 out of 5) on a 5-point Likert scale, a TWCS response of

don't know appeared as the fifth and final choice. Therefore, a response of *don't know* might

indicate (1) a neutral position, (2) confusion based the wording of the item or even (3) no

knowledge of topic in question despite and understanding of the item. This potential confusion

due to poor structure of TWCS items increases the likelihood of measurement error, and in

result, reduced reliability of the instrumentation and generalizability of results.

A final delimitation was that of scale construction for one of the independent variables.

While all four of the scales for the dependent and independent variables were determined to have

a Cronbach's Alpha coefficient greater than .7, one of the scales—the construct of perception of

performance feedback (PPF)—did not possess the same degree of content validity as the other

scales. All other constructs were based on scales used repeatedly in other studies. The PPF scale,

however, was based on a review of the literature and corresponding items borrowed from two

other TWCS constructs, (1) Instructional Practices and Supports and (2) Teacher Leadership. In

addition, the PPF scale consisted of fewer items than the other scales utilized in the study and in

comparison, was a weaker scale than the others used in the research. As a result, the PPF scale is

likely less reliable than the other scales making it more difficult to determine the relationship between PPF and CESE. In hindsight, it would have been wise to develop a more distinct and robust scale for PPF. This would include creation of additional items and a content validity review of the scale by an external panel of experts.

Chapter 4: Results

This chapter reports the findings from the extant data analysis. This information in organized in the following sections: (1) demographic data, (2) descriptive statistics, (3) data analysis and findings, and (4) effect size.

Demographic Data

The sample consisted of 262 teachers from an urban school district who responded to the 2009 Teacher Working Conditions Survey. Out of this sample, 2 teacher cases were missing a significant amount of data (2 responses or more) on either the PPF, PPDO, PSL or CESE. These variables were necessary for this study so the data for these two participants were eliminated from analysis. The resulting sample was analyzed based on gender and race/ethnicity (Table 6, Table 7).

Table 6

Composition of Analysis Sample by Race/Ethnicity (n = 260)

Race/Ethnicity	n	%
White	66	25
Black	183	70
Hispanic	1	<1
Missing	10	4

Table 7

Composition of Analysis Sample by Gender (n = 260)

Gender	n	%
Male	29	11
Female	231	89
Missing	0	0

Descriptive Statistics

A table of descriptive statistics was generated that included means and standard deviations for each of the 4 scales: collective efficacy in student engagement, perception of school leadership, perception of professional development opportunities, and perception of the use of performance feedback (Table 8).

Table 8

Descriptive Statistics (N = 260)

Variable	Mean	SD
Collective Efficacy in Student Engagement	3.18	.51
Perception of School Leadership	3.14	.61
Perception of Professional Development Opportunities	2.96	.60
Perception of the Use of Performance Feedback	2.95	.65

Table 9

TWCS Subscales and Average Reponses to Each Question

Subscale	Item Wording	Mean	Standard Deviation
CESE	Teachers are confident they can motivate students.	3.05	.68
α = .875	Teachers in my school have what it takes to get the children to learn.	3.32	.58
	Teachers in this school are able to get through to difficult students.	2.98	.67
	Teachers in my school really believe that every child can learn.	3.23	.62
	If a child doesn't want to learn, something the first time, teachers here will try another way.	3.32	.53
PPF	Teacher performance is assessed objectively.	3.06	.75
α = .800	Teachers receive feedback that can help them improve teaching.	2.95	.78
	The school leadership facilitates using data to improve student learning.	3.43	.65

PPDO	Professional learning opportunities are aligned with the school's improvement plan.	3.14	.68
α = .949	Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.	2.96	.75
	Professional development deepens teachers' content knowledge.	2.92	.73
	Professional development is differentiated to meet the needs of individual teachers.	2.77	.79
	Professional development enhances teachers' abilities to improve student learning.	3.13	.65
	Professional development is evaluated and results are communicated to teachers.	2.73	.85
	In this school, follow up is provided from professional development.	2.80	.79
	Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.	3.03	.68
	Teachers are encouraged to reflect on their own practice.	3.07	.63
	Sufficient resources are available for professional development in my school.	3.06	.67
	Sufficient time is available for professional development in my school.	2.95	.74
PSL	The faculty and leadership have a shared vision.	2.95	.73
α = .898	The school leadership consistently supports teachers.	2.78	.77
	The school leadership makes a sustained effort to address teacher concerns about managing student conduct.	2.72	.84

Teachers are held to high professional standards or delivering instruction.	3.30	.77
The faculty are recognized for accomplishments.	3.02	.84

Data Analysis and Findings

Descriptive statistics were used to describe and summarize the data. The next steps for the statistical analysis included calculating the Pearson correlation coefficient (r) for the variables and multiple regression analysis. The purpose of this study was to examine the relationship between the dependent variable, collective efficacy in student engagement (CESE), and the independent variables, perception of school leadership (PSL), perception of professional development opportunities (PPDO), and perception of the use of performance feedback (PPF). The Pearson r correlation coefficient was calculated to examine the relationship between each independent variable and the dependent variable (Table 10).

Table 10

Intercorrelations for Responses to Scaled Items on the TWCS

Measure	1	2	3	4
CESE	1	.534**	.599**	.537**
PSL	.534**	1	.734**	.813**
PPDO	.599**	.734**	1	.718**
PPF	.537**	.813**	.718**	1

*Note. * Correlation is significant at p<.001 (1-tailed).*

First Research Question

The first relationship examined was between collective efficacy in student engagement (CESE) and perception of school leadership (PPF). The first research question stated:

RQ1: Is collective efficacy in student engagement positively correlated with perception of the use of performance feedback?

The Pearson r correlation coefficient was calculated. A strong, positive correlation was found $(r = .537, p < .001)$ between the two variables.

Second Research Question

The second relationship that was examined was between collective efficacy in student engagement (CESE) and perception of professional development opportunities (PPDO). The second research question stated:

RQ2: Is collective efficacy in student engagement positively correlated with perception of professional development opportunities?

The Pearson r correlation coefficient was calculated from the extant data that examined the relationship between participant's scores on the CESE scale and PPDO scale. A strong, positive correlation was found $(r = .599, p < .001)$ between the two variables.

Third Research Question

The third relationship examined was between collective efficacy in student engagement (CESE) and perception of school leadership (PSL). The third research question stated:

RQ3: Is collective efficacy in student engagement positively correlated with perception of school leadership?

The Pearson r correlation coefficient was calculated from the extant data that examined the relationship between participant's scores on the CESE scale and PSL scale. A strong, positive correlation was found ($r = .534$, $p < .001$) between the two variables.

Fourth Research Question

The fourth research question sought to determine if a combination of the independent variables can predict an outcome of the dependent variable. The fourth research question stated:

RQ4: Can a combination of the social persuasion variables of PPF, PPDO, and PSL predict scores on collective efficacy in student engagement (CESE)?

The F value, or F ratio was used to decide whether the model as a whole possessed statistically significant predictive capability based on the number of variables needed to achieve it. The F-test measures whether the coefficients in the tested model are statistically significantly different from zero allowing rejection of the null hypothesis. Using the F-test, it was determined that PPF, PPDO, and PSL explain a significant amount of the variance in the CESE ($F(3, 256) = 52.44$, $p < .001$, $R^2 = .62$, $R^2_{Adjusted} = .37$). Multiple regression was initially run in SPSS and it was determined that only PPDO was a significant predictor of CESE (Table 11, Table 12).

Table 11

Regression Analysis Summary for Social Persuasion Variables Predicting CESE

Variable	B	SE B	β	t	p
PSL	.085	.074	.084-.123	1.15	.251
PPDO	.349	.067	.388-.427	5.24	.000
PPF	.131	.075	.161-.178	1.76	.079

Note. $R^2 = .38$ (N = 260, $p < .001$).

Table 12

Results of Significance and Degrees of Freedom for the Regression Equation Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.450	3	8.483	52.439	.001
	Residual	41.414	256	.162		
	Total	66.864	259			

a. Predictors: (Constant), PPF, PPDO, PSL

b. Dependent Variable: CESE

Since neither PPF nor PSL were found to be significant predictors of CESE, collinearity diagnostics were examined. Though condition indices were within a desirable range, variance proportions indicated that both PPF and PSL shared a significant portion of the variance, with values of .86 and .74 respectively. This was problematic, since collinearity diagnostics should only indicate one variable with a significant proportion of the shared variance (Tabachnick & Fidell, 2014). This amount of shared variance indicated difficulty in determining any unique contribution of PPF or PSL. Since intercorrelations for responses to scaled items indicated that the predictor variable PPF was much more strongly correlated with other predictor variables than it was with the indicator variable (Table 10), regression analysis was rerun with only the predictor variables PSL and PPDO.

Using the F-test, it was determined that PSL and PPDO explain a significant amount of the variance in the CESE ($F(2, 257) = 76.37$, $p < .001$, $R^2 = .61$, $R^2_{Adjusted} = .37$). Multiple regression analysis was then conducted to evaluate how well perception of professional development opportunities (PPDO) and perception of school leadership (PSL) predicted collective efficacy in student engagement (CESE). The linear combination of professional development opportunities (PPDO) and perception of school leadership (PSL) was significantly

related to collective efficacy in student engagement (CESE), $F_{(257)} = 76.367$, $p < .001$. The

multiple R-squared was was .373, indicating that 37.3% of the variance of the CESE can be

accounted for by the linear combination of perception of professional development opportunities

(PPDO) and perception of school leadership (PSL). The regression equation for predicting the

collective efficacy in student engagement was:

CESE=.384xPPDO+.163xPSL+1.56. The analysis shows that PPDO did significantly predict

CESE (Beta = .38, $t(259) = 6.05$, $p < .006$), and that PSL did significantly predict CESE (Beta =

.16, $t(259) = 2.77$, $p < .001$). Table 13 displays a model summary of the multiple regression.

Table 14 displays the results of significance and degrees of freedom for the regression equation

model.

Table 13

Multiple Regression Model Summary

Model	R	R Squared	Adjusted R Squared	Standard Error of the Estimate
1	.611	.373	.368	.40397

a. Predictors: (Constant), PPDO, PSL

Table 14

Results of Significance and Degrees of Freedom Excluding PPF

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.924	2	12.462	76.367	.000
	Residual	41.940	257	.171		
	Total	66.864	259			

   c. Predictors: (Constant), PPDO, PSL

   d. Dependent Variable: CESE

Table 15 contains a summary of multiple regression analysis of the independent and dependent variables. The standardized beta scores show that perception of professional development opportunities (PPDO) is the greatest predictor of collective efficacy in student engagement (CESE) followed by perception of school leadership (PSL). The values are .394 and .154 respectively.

Table 15

Multiple Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.563	.133		12.612	.000
	PPDO	.384	.059	.062-.064	6.640	.000
	PSL	.163	.064	.057-.059	2.860	.006

a. Dependent Variable: CESE

Effect Size

In regression analysis, R-squared measures the effect size. According to Cohen (1992), R-squared values of .25, .09, and .01 correspond to large, moderate, and small relationships. The R-squared value for the multiple regression analysis is .373 (Table 13). This indicates that 37.3% of the variance of the dependent variable can be accounted for by the independent variables, PSL and PPDO.

Testing of Assumptions

In order to draw conclusions about a population using regression analysis, the assumptions of multiple regression must hold true (Berry, 1993; Tabachnick & Fidell, 2014). As part of analysis, steps were taken to ensure that the assumptions of multiple regression (i.e., linearity, normality of residuals, homoscedasticity, and independence of residuals) were met. Steps were also taken to check the data for the influence of outliers and to detect significant intercorrelation between the independent variables.

Initially, Casewise Diagnostics indicated that participants 38 and 64 were potential outliers. However, further analysis of standard residuals showed that the data contained no extremely significant outliers (Std. Residual Min = -2.71, Std. Residual Max = 3.39), both values of which were within or very close to the minimum and maximum values (Std. Residual Min = -3.29, Std. Residual Max = 3.29) recommended by Tabachnick and Fidell (2014).

An examination of the histogram of standardized residuals displayed approximately normally distributed errors, as did the normal P-P plot of standardized residuals, which showed points that were not completely on the line of normal distribution, but close. The scatterplot of standardized residuals showed that the data met the assumptions of homogeneity of variance and linearity. When Tolerance is less than 0.1 or VIF values are greater than 10, multicollinearity is a cause for concern (Tabachnick & Fidell, 2014). Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern (PSL, Tolerance = .47, *VIF* = 2.16; PPDO, Tolerance = ..47, *VIF* = 2.16). The data also met the assumption of non-zero variances (CESE, Variance = .260; PPDO, Variance = .356; PSL, Variance = .410).

Conclusions

The data analysis seems to reinforce information from the literature review regarding the influence of school social persuasion variables on collective efficacy for student engagement. A multiple regression of social persuasion variables (i.e., performance feedback, professional development opportunities, and school leadership) was conducted to examine the relationship between the variables and to determine which variable, if any, has the most influence on the dependent variable, collective efficacy in student engagement.

The multiple regression indicated that social persuasion variables of schools are positively correlated with collective efficacy in student engagement. Perception of the use performance feedback (PPF), professional development opportunities (PPDO), and school leadership (PSL) are all significantly correlated with collective efficacy in student engagement (CESE). The predictor variable PPF, however, was more strongly correlated with the other social persuasion predictor variables than it was with the outcome variable, CESE. Out of the three social persuasion variables analyzed, only perception of professional development opportunities and school leadership possessed significant predictive power for collective efficacy in student engagement. Out of the social persuasive variables examined, professional development opportunities also possessed the most influence on the dependent variable, collective efficacy in student engagement.

Chapter 5: Discussion, Implications, and Recommendations

This chapter includes a discussion of (1) the purpose of the study, (2) an overview of the methodology, (3) a summary of results, (4) discussion of the results, (5) recommendations for practice, and (6) recommendations for further research.

Purpose of the Study

The purpose of this quantitative research was to measure the relationships between the social persuasion variables of schools (professional development opportunities, school leadership, and the use of performance feedback) and teacher collective efficacy in student engagement (CESE). Specifically, the study was designed to answer the following research questions:

RQ1: Is collective efficacy in student engagement (CESE) positively correlated with perception of the use of performance feedback (PPF)?

RQ2: Is collective efficacy in student engagement (CESE) positively correlated with perception of professional development opportunities (PPDO)?

RQ3: Is collective efficacy in student engagement (CESE) positively correlated with perception of school leadership (PSL)?

RQ4: Can a combination of the social persuasion variables of perception of the use of performance feedback (PPF), perception of professional development opportunities (PPDO), and perception of school leadership (PSL) predict scores on collective efficacy in student engagement (CESE)?

The construct of collective efficacy in student engagement (Bandura, 1997; Goddard, et al., 2004) provided the primary means used to examine teachers' collective efficacy in student

engagement.   Secondary data analysis of the Teacher Working Conditions Survey (TWCS) of 2009 was conducted. The findings in this study seek to advance the current understanding of CESE and help to identify school level factors that improve teachers' ability to engage students

Methodology

Teachers' ability to engage students is in influenced by their collective efficacy beliefs. Collective efficacy impacts school success, individual teachers' commitment to shared goals, and their commitment to collaborate with others towards these goals (Bandura, 1997; Goddard et al., 2000; Goddard et al., 2004). Based on the research questions and a review of the literature on teacher efficacy, collective efficacy, and collective efficacy in student engagement, three independent variables and one dependent variable were identified.   Independent variables focused on the socially persuasive elements of schools and included perception of the use of performance feedback in schools (PPF), perception of professional development opportunities (PPDO), and perception of school leadership (PSL). The dependent variable identified was collective efficacy in student engagement (CESE).

Survey results from the teacher Working Conditions Survey (TWCS) were used as the source of extant data for this study to help answer the research questions and to explore potential relationships between variables. The TWCS utilized a process of "opportunity" sampling that occurred between July and November 2009. This sampling process resulted in 4,946 teachers from 317 schools in six large school districts being recruited into the first year of the study (AY 2009-2010). The data were compiled at by the University of Michigan and housed in the Interuniversity Consortium for Political and Social Research (ICPSR) data system. Once approved for use of the confidential data, researchers were granted a secure login in order to access and analyze data through ICPSR's Virtual Data Enclave (VDE).

For this research, the outcome variable was based on responses to the TWCS that employed the same Collective Efficacy Scale (CE-Scale) utilized by Goddard (2004) and Moolenaar, Sleegers, and Daly (2012). Continuous, composite variables were created by computing the mean of selected survey items for both predictor and outcome variables. Predictor variables in this study consisted of school social persuasion variables (the use of performance feedback, professional development opportunities, and school leadership). All items used on the outcome and predictor variable scales asked participants to describe their extent of agreement with each item from strongly disagree to strongly agree along a 4-point scale.

A subsample of 262 cases, all of which were from a single urban school district, was selected for analysis. Data cleaning and case deletion resulted in a sample size of 260 cases. Correlation and multiple regression analysis were used in order to assess the relationship between one dependent variable (DV) and multiple independent variables (IVs). Correlation allowed the measurement for the direction and magnitude of the linear relationship between variables.

Multiple regression statistics were also used to assess the relationship between the dependent variable and the three independent variables. The calculation of regression coefficients between dependent and independent variables was conducted in SPSS. In addition, steps were taken to ensure that the assumptions of multiple regression (i.e., linearity, normality of residuals, homoscedasticity, and independence of residuals) were met (Tabachnick & Fidell, 2014). Steps were also taken to check the data for the influence of outliers and to detect multicollinearity. Multiple regression analysis was also used to determine if a combination of the independent variables could be utilized to predict a teacher's scores on the dependent

variable, and to determine which independent variables have the most influence on the dependent variable.

Concerns with the Measures of Effective Teaching Longitudinal Database

The experience of working with data housed in the Measures of Effective Teaching Longitudinal Database (METLB) revealed a number of unanticipated problems. For example, it was often difficult to conduct data access and data analysis remotely through the Virtual Data Enclave (VDE). Due to the speed of the internet connection and a number of other, unresolvable issues, SPSS would often 'freeze' when remote access lasted any significant amount of time. As a result, data analysis took more time than normal to conduct. In addition, the enclave prevented Teacher Working Conditions Survey (TWCS) data, tables, and output from being exported until analysis was complete and required Interuniversity Consortium for Political and Social Research (ICPSR) approval.

The greatest concerns, however, arose from administration of the survey instrument itself. While the TWCS contained a number of items that asked teachers to assess the quality and the characteristics of school life, all 200 items were administered in a single setting. Dillman and Groves (2011) suggest that questionnaire length can potentially impact participant responses. A survey instrument with 200 items is likely to cause fatigue amongst respondents, thus increasing the likelihood of measurement error. In addition, TWCS respondents were able to self-identify at MET study sites and provide their MET Identification Number (ID). As a result, a large number of ICPSR district identifiers (84%) were missing. This significant amount of data loss is also disconcerting. Finally, participating teachers who were part of the study received a $1500 incentive for participating. It is possible that such a substantial amount of money attracted individuals who did not possess a sincere interest in participating in the study.

Summary of Results

1. *There is a significant, positive relationship between the use of performance feedback (PPF) and teachers' collective efficacy (CESE) in student engagement.* The first relationship that was examined was between collective efficacy in student engagement (CESE) and perception of school leadership (PPF). The first research question stated:

RQ1: Is collective efficacy in student engagement positively correlated with perception of the use of performance feedback?

The null hypothesis being tested (H1$_0$) was that there is no positive relationship between the use of performance feedback and teachers' collective efficacy in student engagement.

The Pearson r correlation coefficient was calculated. A strong, positive correlation was found *(r = .537, p < .001)* between the two variables. This resulted in the rejection of the null hypothesis (H1$_0$). The Correlation analysis of the variables revealed a significant positive relationship between the predictor variable perception of performance feedback (PPF) and the outcome variable teachers' collective efficacy (CESE) in student engagement.

2. *There is a significant, positive relationship between perception of professional development opportunities (PPDO) and teachers' collective efficacy in student engagement (CESE).* The second relationship that was examined was between collective efficacy in student engagement (CESE) and perception of school leadership (PPDO). The second research question stated:

RQ2: Is collective efficacy in student engagement positively correlated with perception of professional development opportunities?

The null hypothesis being tested (H2$_0$) was that there is no positive relationship between perception of professional development opportunities and collective efficacy in student

engagement. Correlation analysis of the variables revealed a strong positive relationship $(r = .599, p < .001)$ between the predictor variable perception of professional development opportunities (PPDO) and the outcome variable teachers' collective efficacy (CESE) in student engagement. This resulted in the rejection of the null hypothesis $(H2_{0)})$.

3. *There is a significant, positive relationship between perception of school leadership (PSL) and collective efficacy in student engagement (CESE)*. The third relationship that was examined was between collective efficacy in student engagement (CESE) and perception of school leadership (PSL). The third research question stated:

RQ3: Is collective efficacy in student engagement positively correlated with perception of school leadership?

The null hypothesis being tested $(H3_{0)})$ was that there is no positive relationship between perception of school leadership and collective efficacy in student engagement. Correlation analysis of the variables revealed a strong, positive relationship $(r = .534, p < .001)$ between the predictor variable perception of school leadership (PSL) and the outcome variable teachers' collective efficacy (CESE) in student engagement. This resulted in the rejection of the null hypothesis $(H3_{0)})$.

4. *A significant positive relationship exists between perception of school leadership (PSL) and perception of professional development opportunities (PPDO)*. Though not directly tested through a null hypothesis, correlation analysis of the variables also revealed a significant positive relationship $(r = .734, p < .001)$ between the predictor variable perception of school leadership (PSL) and the predictor variable perception of professional development opportunities (PPDO).

5. *A significant positive relationship exists between perception of school leadership (PSL) and perception of performance feedback (PPF).* Though not directly tested through a null hypothesis, correlation analysis of the variables also revealed a significant positive relationship *(r = .813 p < .001)* between the predictor variable perception of school leadership (PSL) and the predictor variable perception of performance feedback (PPF).

6. *A significant positive relationship exists between perception of school leadership (PSL) and perception of performance feedback (PPF).* Though not directly tested through a null hypothesis, correlation analysis of the variables also revealed a significant positive relationship *(r = .718 p < .001)* between the predictor variable perception of school leadership (PPDO) and the predictor variable perception of performance feedback (PPF).

7. *Perception of school leadership (PSL) is a significant predictor of collective efficacy in student engagement (CESE).* The fourth research question stated:

RQ4: Can a combination of the social persuasion variables of perception of the use of performance feedback (PPF), perception of professional development opportunities (PPDO), and perception of school leadership predict scores on collective efficacy in student engagement (CESE)?

The null hypothesis being tested ($H4_0$) was that combined, the variables cannot predict a CESE score. Regression analysis of the variables revealed that perception of school leadership (PSL) is a significant predictor of collective efficacy in student engagement (CESE). Based on the value of the correlation coefficient ($r=.163$, $p=.001$), it was determined that 16.3% of the variance of the CESE can be explained by perception of perception of school leadership (PSL).

8. *Perception of professional development opportunities (PPDO) is a significant predictor of collective efficacy in student engagement (CESE).* Regression analysis of the

variables revealed that perception of professional development opportunities (PPDO) is a significant predictor of collective efficacy in student engagement (CESE). Based on the value of the correlation coefficient ($r=.384$, $p=.001$), it was determined that 38.4% of the variance of the CESE can be explained by perception of professional development opportunities (PPDO).

9. *Perception of the use of performance feedback (PPF) is not a significant predictor of collective efficacy in student engagement (CESE).* Regression analysis of the variables revealed that perception of performance feedback (PPF) is not significant predictor of collective efficacy in student engagement (CESE).

10. *A combination of social persuasion variables of perception of professional development opportunities (PPDO) and perception of school leadership (PSL) can predict scores on collective efficacy in student engagement (CESE).* Multiple regression analysis indicated that 37% of the variability of the dependent variable can be accounted for by the relationship between the dependent variable collective efficacy in student engagement (CESE) and independent variables of perception of professional development opportunities (PPDO) and perception of school leadership (PSL).

Discussion of the Results

At the heart of this study was a question regarding the extent to which socially persuasive variables can predict collective efficacy in student engagement. For the results to support hypotheses, correlation and multiple regression analysis were utilized. This section presents a discussion of the correlations and variable combinations in relation to the research questions.

Research Question #1

Is collective efficacy in student engagement positively correlated with perception of the use of performance feedback?

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The first relationship examined was between collective efficacy in student engagement (CESE) and perception of the use of performance feedback (PPF). The research rejected the null hypothesis based on the strong, positive correlation was found *(r = .537, p < .001)* between the two variables. The alternate hypothesis was accepted. There is a significant positive relationship between the use of performance feedback and teachers' collective efficacy in student engagement. The Pearson r correlation coefficient was calculated from the extant data that examined the relationship between participant's scores on the CESE scale and PPF scale.

Based on findings from the literature review, it was anticipated that a positive correlation would exist between CESE and PPF (e.g., Gully et al., 2002). One possible explanation is that, much like previously conducted organizational behavior studies outside the field of education, teacher collective efficacy beliefs are shaped over time by performance feedback (Gibson & Earley, 2007; Gist & Mitchell, 1992; Lester, et al., 2002; Marks et al., 2001; Tasa et al., 2007). While previous studies consistently recognized feedback as a means of shaping efficacy, their focus was often limited to performance feedback at the individual level that cannot simply be generalized to feedback research dealing with groups (Barr & Conlon, 1994; Dewett, 2003; (Gabelica et al., 2012). The findings of this research do in fact suggest that performance feedback also correlates with the group collective efficacy in student engagement.

Research Question #2

Is collective efficacy in student engagement positively correlated with perception of professional development opportunities?

The second relationship examined that was between collective efficacy in student engagement (CESE) and perception of professional development opportunities (PPDO). The null hypothesis was not supported by the data and the researcher rejected it. The Pearson r

correlation coefficient was calculated from the extant data that examined the relationship between participant's scores on the CESE scale and PPDO scale. A strong, positive correlation was found ($r = .599$, $p < .001$) between the two variables.

Based on the literature review, it was anticipated that a positive correlation would exist between perception of professional development opportunities (PPDO) and collective efficacy in student engagement (CESE). While earlier studies reported increased individual teacher efficacy scores throughout professional development opportunities (Bolinger, 1988; Robardey et al., 1994), their findings could not necessarily be generalized to group efficacy in student engagement. The findings of this research suggest that professional development opportunities also correlate with teacher collective efficacy in student engagement.

One possible explanation for the correlation between PPDO and CESE is that much of professional development attempts to strengthen teachers' instructional skills and provides teachers experiences that lead them to believe that they can master a specific domain or task (Bandura, 1997; Schunk et al., 2014). More effective teaching practices that result from professional development are likely to provide teachers with mastery experiences, the strongest predictor of individual efficacy and collective efficacy (Ross & Bruce, 2007).

Another explanation is that professional development builds tends to build collegial relationships, which often result in increased feelings of individual and effectiveness (Ashton & Webb, 1986; Ross at al., 1996; Zambo & Zambo, 2008). Professional development opportunities provide participant interaction (Edwards et al., 1998; Robardey et al., 1994; Ross, 1994) and allow educators to observe the success of others and create social settings where teachers can be persuaded that they will be successful with new teaching strategies (Ross & Bruce, 2007).

Research Question #3

Is collective efficacy in student engagement positively correlated with perception of school leadership?

The third relationship that was examined was between collective efficacy in student engagement (CESE) and perception of school leadership (PSL). The null hypothesis was not supported by the data and the researcher rejected it. The Pearson r correlation coefficient was calculated from the extant data that examined the relationship between participant's scores on the CESE scale and PSL scale. A strong, positive correlation was found ($r = .534$, $p < .001$) between the two variables.

Based on the literature review, it was anticipated that a significant positive correlation would exist between PSL and CESE. Though in its nascent stage, an emerging body of research underscores the influence of school leadership on collective efficacy. For example, collective efficacy is improved when school leadership involves teachers in instructionally relevant school decisions (Goddard et al., 2004). Teacher efficacy also improves when school leadership creates opportunities for teachers to collaborate and to share skills and experiences (Pfaff, 2000).

A possible explanation of the correlation between PSL and CESE is research suggests that in schools with effective school leadership, teachers are more likely to exert extra effort and are more likely to be committed to the collective organization and to improving it (Clark et al., 2009; Leithwood & Jantzi, 2005; Ross & Gray, 2006). School leaders also raise awareness of individual members' contributions and capacities (Walumbwa et al., 2004), influence teacher work attitudes, and help them identify with and feel part of the collective mission of the group (Kurt et al., 2011).

Research Question #4

Can a combination of the social persuasion variables of PPF, PPDO, and PSL predict scores on collective efficacy in student engagement (CESE)?

Multiple regression was used to determine if a linear equation based on the three independent variables could predict CESE scores. The significant overall F-Test supports the alternate hypothesis, and the null hypothesis was rejected.

Based on a review of the literature it was anticipated that a combination of PPF, PPDO, and PSL might help predict CESE. However, when multiple regression was initially run in SPSS, it was observed that PPDO, but neither PSL nor PPF were significant predictors of CESE. A standard multiple regression analysis was conducted to evaluate how well perception of professional development opportunities (PPDO) and perception of school leadership (PSL) predicted collective efficacy in student engagement (CESE). The linear combination of professional development opportunities (PPDO) and perception of school leadership (PSL) were able to predict collective efficacy in student engagement (CESE), $F((257) = 76.367$, $p < .001$. The R-squared coefficient was .373 indicating that 37.3% of the variance in CESE can be accounted for by the linear combination of perception of professional development opportunities (PPDO) and perception of school leadership (PSL). The regression equation for predicting the collective efficacy in student engagement was: CESE=.394xPPDO+.154xPSL+1.55. The independent variables of perception of professional development opportunities and perception of school leadership were significant, whereas perception of school leadership was not significant. Past research examining the relationship between performance feedback and collective efficacy suggested that constructive performance feedback can increase collective efficacy perceptions (e.g., Jung & Sosik, 2003). In this study,

however, performance feedback was not significant predictor. A likely explanation is the potentially problematic PPF scale used in the study. Though the PPF scale possessed an acceptable Chronbach alph (α = .800), it did not possess the same degree of content validity as the other scales. All other constructs were based on scales used repeatedly in other studies. The PPF scale, however, was based on a review of the literature and borrowed items from two other TWCS constructs, (1) Instructional Practices and Supports and (2) Teacher Leadership. In addition, the PPF scale consisted of fewer items than the other scales utilized in the study and in comparison, was a weaker scale than the others used in the research. It is very possible that the weaker scale resulted in weaker predictive ability for PPF.

The standardized beta scores show that perception of professional development opportunities (PPDO) is the greatest predictor of collective efficacy in student engagement (CESE) followed by perception of school leadership (PSL). The values are .394 and .154 respectively. In regression analysis, R-squared measures the effect size. According to Cohen (1992), R-squared values of .25, .09, and .01 correspond to large, moderate, and small relationships. According to the data in Table 13, the R-squared value for the multiple regression analysis is .373. This indicates that 37.3% of the variability of the dependent variable can be accounted for by the relationship between the dependent and independent variables, leaving 63% of variability unexplained.

The explanation of only 37% of the variance seems to coincide with the notion that collective teacher efficacy is rooted in four sources of information—mastery experience, vicarious experience, affective state, and social persuasion with mastery experience identified as having the most influence (Bandura, 1986; Bruce et al., 2010; Chong et al., 2010; Gist &

Mitchel, 1992; Goddard et al., 2000; Goddard et al., 2004). This research only examined one of those relationships—social persuasion.

Recommendations for Practice

1. *Seek to improve the quality of professional development opportunities offered to staff*. Professional development is an ongoing need for teachers. Research suggests that schools with a strong focus on instructional practices have an impact on the knowledge and effectiveness of their teachers (Brinson & Steiner, 2007). Previous studies have reported increased individual teacher efficacy scores throughout professional development opportunities (e.g., Bolinger, 1988; Rimm-Kaufman & Sawyer, 2004; Robardey, et al., 1994; Ross, 1994; Stein & Wang, 1988). Therefore, schools and districts should attempt to strengthen teachers' instructional skills, competence level, and belief that they can master specific domains (Bandura, 1997; Schunk et al., 2014). In addition, more effective teaching practices that result from professional development are likely to provide teachers with mastery experiences, the strongest predictor of individual efficacy (Ross & Bruce, 2007). This research also suggests that professional development opportunities impact collective efficacy. As a result, schools would be wise to focus on both the design and delivery components of professional development that were part of the scale used in this research. *Design elements* of professional development might include alignment with school's improvement plan, sufficient time and resources, the deepening of teachers' content knowledge, a focus on meeting the needs of diverse students, strategic encouragement of teacher reflection of their own practice, and the evaluation of professional development. Professional development *delivery*, however, includes ongoing opportunities of learning, differentiation to meet the needs of teachers, and follow up opportunities. Improving both the

design and delivery of professional development are crucial components for schools seeking

to improve teacher effectiveness (Loucks-Horsley, Stiles, Mundry, Love, & Hewson, 2009;

Penuel, Fishman, Yamaguchi, & Gallagher, 2007).

2. *Work to improve teacher perception of school leadership in schools and districts*. This

research adds to the growing body of evidence that school leadership can influence teacher

collective efficacy. Research suggests that teachers in schools characterized by effective

school leadership are more likely than other teachers to exert extra effort and are more likely

to be committed to the collective organization and to improving it (Clark et al., 2009;

Leithwood & Jantzi, 2005). Research has repeatedly reported higher individual teacher

efficacy when school leaders are perceived as influential (Goddard & Goddard, 2001; Hoy &

Woolfolk, 1993). The findings of this research suggest a similar phenomenon regarding

collective efficacy in student engagement and a point to the need to explore ways to improve

teacher perception of school leadership. In particular, school leaders would be wise to focus

on the leadership components that were part of the scale used in this research. These

components are key indicators of collective efficacy and include a shared vision between

faculty and leadership, leadership support of teachers, holding teachers to high professional

standards, and recognizing faculty for their accomplishments (Ware & Kitsantas, 2007).

3. *Seek to improve the performance feedback offered to educators*. The results of this research

did not identify perception of performance of feedback as a significant predictor of collective

efficacy in student engagement. Yet, organization research studies offer evidence that

collective efficacy beliefs are shaped over time by performance feedback (Gibson & Earley,

2007; Gist & Mitchell, 1992; Lester et al., 2002; Marks et al, 2001; Tasa et al., 2007).

Feedback is considered a powerful contributor to the development of team performance

(Kozlowski & Ilgen, 2006; London & Sessa, 2006) and serves several valuable functions including: guiding current efforts, clarifying desired outcomes and processes, helping to adjust goals and processes, and promoting critical reflection on existing tasks, situations and approaches (Bartram & Roe, 2008). Performance feedback also allows groups to regulate and monitor themselves in order to effectively complete a task (London & Sessa, 2006). As a result, schools seeking to improve teacher practice and student learning should continually seek to improve the feedback provide to teachers in order to allow them to adjust their performance.

Recommendations for Further Research

1. *Conduct research on social persuasive variables with a larger, randomly selected sample.* Analyses in this research were limited to only cases 260 cases, all of which were from a single urban school district and selected through opportunity sampling. In order to increase generalizability and statistical power of further analyses, further research should seek to obtain a larger, randomly selected sample of educators from around the country. Such efforts are more likely to provide additional insight into teacher collective efficacy.

2. *Identify other social persuasion variables that help predict collective efficacy in student engagement (CESE).* This study identified two social persuasive variables, perception of professional development opportunities (PPDO), and perception of school leadership (PSL) that predict CESE. Yet these social persuasive variables only account for 37.3% of the variance in CESE. As a result, future research should seek to identify other social persuasion variables that can be combined with PPDO and PSL to help explain more of the variance of CESE.

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3. *Include other, non-social persuasive factors in future analysis.* Researchers already agree that teacher efficacy is subject to a number of other contextual influences that extend beyond social persuasion variables (Ross, Cousins, & Gadalla, 1996; Tschannen-Moran et al. 1998, Tscahnnen-Moran & Woolfolk Hoy, 2006). These factors include the demographic and contextual factors of schools, faculty's experience level, school socioeconomic status, and students' prior academic performance (Goddard & Skria, 2006; Klassen & Chiu, 2010). Further research on the collective efficacy in student engagement should seek either to control for these factors or to incorporate them into regression models.

4. *Develop a distinct scale of perception of performance feedback.* In this research, a scale was developed from a review of the literature and existing TWCS items in order to gauge teacher perception of performance feedback. Though the PPF scale possessed an acceptable Chronbach alpha ($\alpha = .800$), it did not seem to possess the same degree of content validity as the other scales. In the future, researchers should seek to develop a more robust, distinct PPF scale through added items based on a literature review and subjecting future scales to input from content and construct experts.

Conclusions

A multiple regression of social persuasion variables was conducted to examine the relationship between the variables and to determine which predictor variable, if any, has the most influence on the dependent variable. The multiple regression analysis showed that a combination of the independent variables of PPDO and PSL could explain 37% of the variance in CESE. Analyses also showed that PPDO had the strongest relationship with CESE.

The results reinforce information from the literature review regarding the research questions and hypotheses. The social persuasion variables of schools are correlated with

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collective efficacy in student engagement. Perceptions of the use performance feedback, professional development opportunities, and school leadership are all significantly correlated with collective efficacy in student engagement. The combination of the social persuasion variables can predict CESE, but out of the three social persuasion variables analyzed, only perception of professional development opportunities and school leadership explain a significant amount of the variance in collective efficacy in student engagement.

References

Acock, A. C. (2005). Working with missing values. *Journal of Marriage and Family*, *67*(4), 1012-1028.

Adams, C. M., & Forsyth, P. B. (2006). Proximate sources of collective teacher efficacy. *Journal of Educational Administration*, *44*(6), 625-642.

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

Alvero, A., Bucklin, B., & Austin, J. (2001). An objective review of the effectiveness and essential characteristics of performance feedback in organizational settings. *Journal of Organizational Behavior Management, 21*, 3-29.

Ashton, P. T., & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement.* New York: Longman.

Avalos, B. (2011). Teacher professional development in Teaching and Teacher Education over ten years. *Teaching and Teacher Education*, *27*(1), 1-20.

Bandalos, D. L., & Finney, S. J. (2010). Exploratory and Confirmatory. *The reviewer's guide to quantitative methods in the social sciences*, 93.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.

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

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28* (2), 117-148.

Bandura, A. (1997). *Self efficacy: The exercise of control.* New York: W. H. Freeman & Co.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122.

Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science*, *9*(3), 75-78.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual review of Psychology*, *52*(1), 1-26.

Bandura, A., Barbaranelli, C., Caprara, G., & Pastorelli, C. (1996). Multifaceted

impact of self-efficacy beliefs on academic functioning. *Child Development*, *67*, 1206–1222.

Barr, S. H., & Conlon, E. J. (1994). Effects of distribution of feedback in work groups. *Academy of Management Journal, 37*, 641–655.

Bartram, D., & Roe, R. A. (2008). Individual and organizational factors in competence acquisition. In W. Nijhof (Ed.), *The Learning Potential of the Workplace.* Rotterdam: Sense Publishers.

Bass, B.M., and Avolio, B.J. (1994), *Improving Organizational Effectiveness Through Transformational Leadership*. Thousand Oaks, CA: Sage.

Basow, S. A., Phelan, J. E., & Capoloslo, L. (2006). Gender patterns in college students' choices of their best and worst professors. *Psychology of Women Quarterly, 30,* 25-35.

Beijaard, D., Verloop, N., & Vermunt, J. D. (2000). Teachers' perceptions of professional identity: an exploratory study from a personal knowledge perspective. *Teaching and Teacher Education, 16*(7), 749-764.

Berry, W. D. (1993). *Understanding regression assumptions* (Vol. 92). Thousand Oaks, CA: Sage.

Bieber, S. L. (1988). Multiple regression and its alternatives. *The Social Science Journal*, *25*(1), 1-19.

Bill and Melinda Gates Foundation. *Measures of Effective Teaching: 1 - Study Information.* ICPSR34771-v2. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2013-09-23. doi:10.3886/ICPSR34771.v2

Bolinger, R. (1988). *The effects of instruction in the Hunter instructional model on teachers' sense of efficacy*, (Unpublished doctoral dissertation), Montana State University, Bozeman, Montana.

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(8), 3-15.

Boud, D. (2000). Sustainable assessment: rethinking assessment for the learning society. *Studies in continuing education*, *22*(2), 151-167.

Bransford, J., Darling-Hammond, L., & LePage, P. (2005). Introduction. In L. Darling-Hammond, & J. Bransford (Eds.), *Preparing teachers for a changing world* (pp. 1- 39). San Francisco: Jossey-Bass.

Brookhart, S. M., & Loadman, W. E. (1990). School-University Collaboration: Different Workplace Cultures. *Contemporary education*, *61*(3), 125-28.

Brewster, A., & Bowen, G. (2004). Teacher support and school engagement of Latino middle and high school students at risk of school failure. *Child and Adolescent Social Work Journal*, 21(1), 47-67.

Brinson, D. & Steiner, L. (2007, October). *Building collective efficacy: How leaders inspire teachers to achieve* (Issue Brief). Washington, DC: The Center for Comprehensive School Reform and improvement.

Brouwers, A., & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and teacher education*, *16*(2), 239-253.

Brouwers, A., Tomic, W., & Boluijt, H. (2011). Job demands, job control, social support and self-efficacy beliefs as determinants of burnout among physical education teachers. *European Journal of Psychology, 7,* 17–39.

Brown, A. L., & Cocking, R. R. (2000). *How people learn* (pp. 285-348). J. D. Bransford (Ed.). Washington, DC: National Academy Press.

Bruce, C. D., Esmonde, I., Ross, J., Dookie, L., & Beatty, R. (2010). The effects of sustained classroom-embedded teacher professional learning on teacher efficacy and related student achievement. *Teaching and Teacher Education*, *26*(8), 1598-1608.

Butler-Kisber, L., & Portelli, P. (2003). Editorial: The challenges of student engagement: Beyond mainstream conceptions and practices. *McGill Journal of Education, 38(*2), 207.

Cappelli, P., & Rogovsky, N. (1994). New work systems and skill requirements. *Int'l Lab. Rev.*, *133*, 205.

Chan, D. (2009). So why ask me? Are self-report data really that bad. *Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and social sciences*, 309-336.

Chapman, E. (2003). Alternative approaches to assessing student engagement rates. *Practical assessment, research and evaluation*, *13*(8).

Cheung, H. (2008). Teacher efficacy: A comparative study of Hong Kong and Shanghai primary in-service teachers. *Australian Educational Researcher*, 35(1), 103-123.

Chong, W., Klassen, R., Huan, V., Wong, I., & Kates, A. (2010). The relationships among school types, teacher efficacy beliefs, and academic climate: Perspective from Asian middle schools. *The Journal of Educational Research*, *103*(3), 183-190.

City, E., Elmore, R., Fiarmn, S., & Teitel, L. (2009). *Instructional rounds in education: A*

network approach to improving teaching and learning. Cambridge, MA: Harvard Education Press.

Clark, D., Martorell, P., & Rockoff, J. (2009). *School Principals and School Performance* (CALDER Working Paper 38).

Clifford, M., Menon, R., Gangi, T., Condon, C., & Hornung, K. (2012). Measuring School Climate for Gauging Principal Performance: A Review of the Validity and Reliability of Publicly Accessible Measures. A Quality School Leadership Issue Brief. *American Institutes for Research*.

Connor, J. M. (2003). Making statistics come alive: Using space and students' bodies to illustrate statistical concepts. *Teaching of Psychology. 30.* 141-143.

Cohen, S. G., & Bailey, D. E. (1997). What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management*, *23*(3), 239-290.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah: Lawrence Erlbaum associates.

Comer, J. P. (1996). *Rallying the whole village: The Comer process for reforming Education*. New York: Teachers College Press.

Corso M., Bundick, M., Qualgia, R., & Haywood, D. (2013). Where student, teacher, and content meet: Student engagement in the secondary school classroom. *American Secondary Education*, *41*(3), 50-61.

Cothran, D. J., & Ennis, C. D. (2000). Building bridges to student engagement: Communicating respect and care for students in urban high schools. *Journal of Research & Development in Education*.

D'Annolfo, S. C., & Schumann, J. A. (2012). Looking through the eyes of the learner: Implementation of building blocks for student engagement. *AASA Journal of Scholarship & Practice*, *9*(3), 32.

Darling-Hammond, L. (1999). *Teacher quality and student achievement: A review of state policy evidence*. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education, 57*(3), 300314.

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education*, *61*(1/2), 35-47.

Darling-Hammond, L., Amrein-Beardsley, A., Haertel, E., & Rothstein, J. (2012). Evaluating teacher evaluation. *Phi Delta Kappan*, 8-15.

Day, R. S. 1980. Teaching from notes: Some cognitive consequences. ed. W. J. McKeachie. In *Learning, Cognition, and College Teaching: New Directions for Teaching and Learning*, San Francisco: Jossey-Bass.

Dean, C. B., & Marzano, R. J. (2012). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: Association for Supervision and Curriculum Development.

Dewett, T. (2003). Towards an interactionist theory of group-level feedback. *Management Research News, 26*(10–11), 1–121.

DeVellis, R. F. (2011). *Scale development: Theory and applications*. Newbury Park: Sage Publications.

Dillman, D., & Groves, B. (2011). Internet, mail and Mixed-Mode Surveys: The Tailored Design Method 3 rd ed. *Survey Research*, *34*(833), 635.

Edwards, J. L., Green, K. E., Lyons, C. A., Rogers, M. S., & Swords, M. E. (1998, April). *The effects of cognitive coaching and nonverbal classroom management on teacher efficacy and perceptions of classroom culture.* Paper presented at the annual meeting of the American Educational Research Association, San Diego.

Fancera, S. F., & Bliss, J. R. (2011). Instructional leadership influence on collective teacher efficacy to improve school achievement. *Leadership and Policy in Schools*, *10*(3), 349-370.

Field, A. (2009). *Discovering statistics using SPSS*. Sage publications.

Finn, J., & Voelkl, K. (1993). School characteristics related to student engagement. *Journal of Negro Education, 62*(3), 249-268.

Frederick, P. J. (1986). The lively lecture—8 variations. *College teaching*, *34*(2), 43-50.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, *74*, 59–109.

Fritz, J., Miller-Heyl, J., Kreutzer, J., & MacPhee, D. (1995). Fostering personal teaching efficacy through staff development and classroom activities. *Journal of Educational Research, 88(*4), 200-208.

Fulmer, S. M., & Frijters, J. C. (2009). A review of self-report and alternative approaches in the measurement of student motivation. *Educational Psychology Review*, *21*(3), 219-246.

Gabelica, C., Bossche, P. V. D., Segers, M., & Gijselaers, W. (2012). Feedback, a powerful lever in teams: A review. *Educational Research Review, 7*(2), 123-144.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston, MA: Pearson.

Gee, J. P. (2013). *The anti-education era: Creating smarter students through digital learning*. New York: Macmillan.

Gibson, S. & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76*, 569-582.

Gibson, C. B., & Earley, P. C. (2007). Collective cognition in action: Accumulation, interaction, examination and accommodation in the development and operation of group efficacy beliefs in the workplace. *Academy of Management Review, 32*(2), 438–458.

Gist, M. & Mitchell, T. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review, 17*(2), 183-211.

Goddard, R.D. (2001), Collective efficacy: a neglected construct in the study of schools and student achievement. *Journal of Educational Psychology, 93*(3), 467-76.

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

Goddard, R.D., Hoy, W.K. & Woolfolk Hoy, A. (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, 18*(3), 403-425.

Goddard, R. D., & Skrla, L. (2006). The influence of school social composition on teachers' collective efficacy beliefs. *Educational Administration Quarterly, 42*(2), 216-235.

Goncalo, J. A., Polman, E., & Maslach, C. (2010). Can confidence come too soon? Collective efficacy, conflict and group performance over time. *Organizational Behavior and Human Decision Processes, 113*(1), 13-24.

Greenwood, C. R., Horton, B. T., & Utley, C. A. (2002). Academic engagement: Current

perspectives on research and practice. *School Psychology Review, 31,* 328–349.

Gully, S. M., Incalcaterra, K. A., Joshi, A., & Beaubien, J. M. (2002). A meta-analysis of team-efficacy, potency, and performance: Interdepence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology, 87,* 819–832.

Guo, Y., Justice, L. M., Sawyer, B., & Tompkins, V. (2011). Exploring factors related to preschool teachers' self-efficacy. *Teaching and Teacher Education*, *27*(5), 961-968.

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

Hair, J., Black, W, Babin, B., & Anderson, R. (2014). *Multivariate data analysis. Multivariate data analysis* (Vol. 7). Upper Saddle River, NJ: Pearson Prentice Hall.

Hattie, J. (2009). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Visible Learning. New York : Routledge.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of educational research*, *77*(1), 81-112.

Hill, T., & Lewicki, P. (2007). *Statistics methods and applications*. Tulsa, OK. StatSoft.

Hipp, K. A. (1996). Teacher Efficacy: Influence of Principal Leadership Behavior.

Hoy, W. K., & Miskel, C. G. (1996). *Educational administration: Theory, research, and practice.* New York: McGraw-Hill.

Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health of schools. Elementary School Journal, 93(4), 355–372.

Jahnke, M. S. (2010). *How teacher collective efficacy is developed and sustained in high achieving middle schools*. Cardinal Stritch University.

Johnson, R. R. B., & Christensen, L. B. (2010). *Educational research: Quantitative, qualitative, and mixed approaches*. Sage Publications.

Jung, D. I., & Sosik, J. J. (2003). Group potency and collective efficacy: Examining their predictive validity, level and analysis, and effects of performance feedback on future group performance. *Group & Organization Management, 28*(3), 366-391.

Kennedy, S. Y., & Smith, J. B. (2013). The relationship between school collective reflective practice and teacher physiological efficacy sources. *Teaching and Teacher Education*, *29*, 132-143.

Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job

satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology*, *102*(3), 741-756.

Klassen, R. M., Usher, E. L., & Bong, M. (2010). Teachers' collective efficacy, job satisfaction, and job stress in cross-cultural context. *The Journal of Experimental Education*, *78*(4), 464-486.

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, *29*, 76-85.

Knoblauch, D., & Hoy, A. W. (2008). "Maybe I can teach those kids." The influence of contextual factors on student teachers' efficacy beliefs. *Teaching and Teacher Education*, *24*(1), 166-179.

Kohler, F. W., & Ezell, H. K. (1999). Promoting changes in teachers' conducts of student pair activities: An examination of reciprocal peer coaching. *Journal of Special Education, 33,* 154-166.

Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest, 7,* 77–124.

Kuh, G. D., Kinzic, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature.* National Postsecondary Education Cooperative (NPEC) Commissioned Report. Washington, DC: National Center for Educational Statistics.

Kukral, N. (2012). Authentic to the CORE.: the disciplinary literacy approach create authentic *Leadership*, *41*(5), 8-10.

Kurt, T., Duyar, I., & Çalik, T. (2011). Are we legitimate yet? A closer look at the casual relationship mechanisms among principal leadership, teacher self-efficacy and collective efficacy. *Journal of Management Development*, *31*(1), 71-86.

Ladd, H. F. (2009). Teachers' Perceptions of Their Working Conditions: How Predictive of Policy-Relevant Outcomes? Working Paper 33. *National Center for Analysis of Longitudinal Data in Education Research*.

Lashinsky, D. D. (2012). *Collective Teacher Efficacy and High School Reorganization as Small Learning Communities: An Action Research Project in Southwestern Colorado* (Doctoral dissertation, University of Washington).

Lee, V. E., Dedrick, R. F., & Smith, J. B. (1991). The effect of the social organization of schools on teachers' efficacy and satisfaction. *Sociology of Education*, 190-208.

Lee, J., Zhang, Z., & Yin, H. (2011). A multilevel analysis of the impact of a

professional learning community, faculty trust in colleagues and collective efficacy on teacher commitment to students. *Teaching and teacher education*, *27*(5), 820-830.

Leithwood, K., & Jantzi, D. (2005). A review of transformational school leadership research 1996–2005. *Leadership and policy in schools*, *4*(3), 177-199.

Lester, S. W., Meglino, B. M., & Korsgaard, M. A. (2002). The antecedents and consequences of group potency: A longitudinal investigation of newly formed work groups. *Academy of Management Journal, 45*(2), 352–368.

Levy, G. D., & Peters, W. W. (2012). Undergraduates' views of best college courses. *Teaching of Psychology, 29,* 46-48.

Lindsley, D. H., Brass, D. J., & Thomas, J. B. (1995). Efficacy-performing spirals: A multilevel perspective. *Academy of Management Review*, *20*(3), 645-678.

Linnenbrink, E. A., & Pintrich, P. R. (2002). Motivation as an enabler for academic success. *School Psychology Review*, *31*, 313–327.

Linnenbrink, E. A., & Pintrich, P. R. (2003). The role of self- efficacy beliefs in student engagement and learning in the classroom. *Reading and Writing Quarterly, 19,* 119–137.

Little, J. W. (1987). Teachers as colleagues. In V. Richardson-Koehler (Ed.), *Educator's Handbook: Research into Practice* (pp. 491-518). New York: Longman.

Locke, L. F., Spirduso, W. W., & Silverman, S. J. (2013). *Proposals that work: A guide for planning dissertations and grant proposals*. SAGE Publications, Incorporated.

London, M. (2003). *Job feedback: Giving, seeking, and using feedback for performance improvement*. Psychology Press.

Loucks-Horsley, S., Stiles, K. E., Mundry, M. S. E., Love, N. B., & Hewson, P. W. (2009). *Designing professional development for teachers of science and mathematics*. Corwin Press.

London, M., & Sessa, V. I. (2006). Group feedback for continuous learning. *Human Resource Development Review, 5*(3), 1–27.

Maguire, K. (2011). *The role of teacher efficacy in student academic achievement in mathematics*. (Unpublished doctoral dissertation), Walden University.

Margolis, H., & McCabe, P. (2004). Resolving struggling readers' homework difficulties: A social cognitive perspective. *Reading Psychology*, *25*(4), 225-260.

Marks, H. (2000). Student engagement in instructional activity: patterns in the elementary, middle and high school years. *American Educational Research Journal, 37*(1), 153-184.

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework
and taxonomy of team processes. *Academy of Management Review, 26*, 356–376.

Martin, N. K., Sass, D. A., & Schmitt, T. A. (2012). Teacher efficacy in student
engagement, instructional management, student stressors, and burnout: A theoretical
model using in-class variables to predict teachers' intent-to-leave. *Teaching and Teacher
Education: An International Journal of Research and Studies, 28*(4), 546-559.

McCoach, D., & Colbert, R. (2010). Factors Underlying the Collective Teacher
Efficacy Scale and Their Mediating Role in the Effect of Socioeconomic Status on
Academic Achievement at the School Level. *Measurement and Evaluation in Counseling
and Development, 43*(1), 31-47.

McMahon, B. J., & Zyngier, D. (2009). Student engagement: contested concepts in two
continents. *Research in Comparative and International Education, 4(*2), 164-181.

McFadden, M., & Munns, G. (2002). Student engagement and the social relations of
pedagogy. *British Journal of Sociology of Education, 23*(3), 357-366.

Meyers, C., & T. B. Jones. 1993. *Promoting active learning. Strategies for the college
classroom*. San Francisco: Jossey-Bass.

Moir, E. (2009). *Validity and reliability of the North Carolina Teacher Working
Conditions Survey.* The University of California at Santa Cruz: New Teacher Center.
Retrieved June 14, 2014, from http://ncteachingconditions.org/sites/
default/files/attachments/validityandreliability.pdf.

Moolenaar, N., Sleegers, P., & Daly, A. (2012). Teaming up: Linking
collaboration networks, collective efficacy, and student achievement. *Teaching and
Teacher Education*, *28*(2), 251-262.

Mulvey, P. W., & Klein, H. J. (1998). The impact of perceived loafing and collective efficacy on
group goal processes and group performance. *Organizational behavior and human
decision processes*, *74*(1), 62-87.

New Teacher Center. (2011). Validity and Reliability of the 2010 North Carolina TWC Survey.
Retrieved July 19, 2014, from http://2012.ncteachingconditions.org/sites/
default/files/attachments/NC10_validityandreliability.pdf

Newmann, F. M., Rutter, R. A., & Smith, M. S. (1989). Organizational factors that affect
school sense of efficacy, community, and expectations. *Sociology of Education*, 221-238.

Newmann, F. M. (1992). Student engagement and achievement in American secondary
schools. New York: Teachers College Press.

O'Connor, K. (2013). Class Participation: Promoting in-class student engagement. *Education*, *133*(3), 340-344.

Ohmart, H. (1992). *The effects of an efficacy intervention on teachers' efficacy feelings.* (Unpublished doctoral dissertation), University of Kansas, Lawrence, Kansas.

Omelicheva, M. Y., & Avdeyeva, O. (2008). Teaching with lecture or debate? Testing the effectiveness of traditional versus active learning methods of instruction. *PS: Political Science & Politics*, *41*(03), 603-607.

Ormrod, J. E. (2013). *Educational psychology: Developing learners* (8th ed). Upper Saddle River, NJ: Prentice Hall.

Ott, L., & Longnecker, M. (2010). *An introduction to statistical methods and data analysis*. Brooks: Brooks/Cole.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*(3), 307-332.

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

Parsons, M., & Stephenson, M. (2005). Developing reflective practice in student teachers: collaboration and critical partnerships. Teachers and Teaching: *Theory and Practice, 11,* 95-116.

Pas, E. T., Bradshaw, C. P., & Hershfeldt, P. A. (2012). Teacher-and school-level predictors of teacher efficacy and burnout: Identifying potential areas for support. *Journal of School Psychology*, *50*(1), 129-145.

Peltonen, K. (2008). Can learning in teams help teachers to become more entrepreneurial? The interplay between efficacy perceptions and team support. *Learning, Teaching, and Assessment, 3*297-324.

Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal*, *44*(4), 921-958.

Peugh, J. L., & Enders, C. K. (2004). Missing data in educational research: A review of reporting practices and suggestions for improvement. *Review of Educational Research*, *74*(4), 525-556.

Pfaff, M. E. (2000, April). *The effects on teacher efficacy of school based collaborative activities structured as professional study groups.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Pines, A. M. (2002). Teacher burnout: a psychodynamic existential perspective. *Teachers & Teaching*, 8(2), 121-140.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of management*, *12*(4), 531-544.

Popham, W. J. (2013). *Classroom Assessment: What Teachers Need to Know* (7th ed.) Pearson/Allyn & Bacon.

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education,* 93,223-231.

Putman, S. (2012). Investigating teacher efficacy: Comparing preservice and inservice teachers with different levels of experience. *Action In Teacher Education*, *34*(1), 26-40.

Raudenbush, S. W., Rowan, B., & Cheong, Y. F. (1992). Contextual effects on the self-perceived efficacy of high school teachers. *Sociology of Education*, 150-167.

Ravet, J. (2007). Making sense of disengagement in the primary classroom: A study of pupil, teacher and parent perceptions. *Research Papers in Education, 22*(3), 333-362.

Reinke, W. M., Herman, K. C., Stormont, M., Newcomer, L., & David, K. (2013). Illustrating the multiple facets and levels of fidelity of implementation to a teacher classroom management intervention. *Administration and Policy in Mental Health and Mental Health Services Research, 40*(6), 494-506.

Renner, P. 1993. *The Art of Teaching Adults*. Vancouver, BC: Training Associates.

Rimm-Kaufman, S. E., & Sawyer, B. E. (2004). Primary-grade teachers' self-efficacy beliefs, attitudes toward teaching, and discipline and teaching practice priorities in relation to the Responsive Classroom approach. *Elementary School Journal, 104*(4), 321-341.

Robardey, C., Allard, D., & Brown, D. (1994). An assessment of the effectiveness of full option science system training for third- through sixth-grade teachers. *Journal of Elementary Science Education, 6*(1), 17-29.

Ross, J. A. (1994). The impact of an in-service to promote cooperative learning on the stability of teacher efficacy. *Teaching and Teacher Education, 10*(4), 381-394.

Ross, J. A. (1995). Strategies for enhancing teachers' beliefs in their effectiveness: research on a school improvement hypothesis. *Teachers College Record, 97*(2), 227-251.

Ross, J. A. (1998). The antecedents and consequences of teacher efficacy. *Advances in research on teaching*, *7*, 49-74.

Ross, J. A., Cousins, J., & Gadalla, T. (1996). Within-teacher predictors of teacher efficacy. *Teaching and Teacher Education*, *12*(4), 385-400.

Ross, J., & Bruce, C. (2007). Professional development effects on teacher efficacy: Results of randomized field trial. *The Journal of Educational Research*, *101*(1), 50-60.

Ross, J. A., & Gray, P. (2006). Transformational leadership and teacher commitment to organizational values: the mediating effects of collective teacher efficacy. *School Effectiveness and School Improvement, 17,* 179-199.

Rousseeuw, P. J., & Leroy, A. M. (2005). *Robust regression and outlier detection* (Vol. 589). John Wiley & Sons.

Rubin, D. B. (2004). *Multiple imputation for nonresponse in surveys* (Vol. 81). John Wiley & Sons.

Rubin, D. B. (1996). Multiple imputation after 18+ years. *Journal of the American Statistical Association*, *91*(434), 473-489.

Runhaar, P., Sanders, K., & Yang, H. (2010). Stimulating teachers' reflection and feedback asking: An interplay of self-efficacy, learning goal orientation, and transformational leadership. *Teaching and teacher education*, *26*(5), 1154-1161.

Samples, J., & Copeland, S. (2013). The universality of good teaching: A study of the descriptors across disciplines *International Journal of Teaching and Learning in Higher Education*, *25*(2), 176-188.

Santos, J. (1999). Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension*, *37*(2), 1-5.

Saphier, J. (2009). How coaches can maximize student learning. *Phi Delta Kappan*, *91*(4), 46-50.

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly*, 18, 158–176.

Schunk, D. H. (2001). Social cognitive theory and self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (pp. 125–151). Mahwah, NJ: Erlbaum.

Schunk, D. H., Meece, J. L., & Pintrich, P. R. (2014). *Motivation in education: Theory, research, and applications*. Boston: Pearson.

Skinner, E., & Belmont, M. (1993). Motivation in the classroom: reciprocal effects of teacher behaviour and student engagement across the school year. *Journal of*

Educational Psychology, *85*(4), 571-581.

Solomon, B. G., Klein, S. A., & Politylo, B. C. (2012). The Effect of Performance Feedback on
    Teachers' Treatment Integrity: A Meta-Analysis of the Single-Case Literature. *School
    Psychology Review*, *41*(2), 160-175.

Stein, M., & Wang, M. (1988). Teacher development and school improvement: The
    process of teacher change. *Teaching and Teacher Education, 4*(2), 171-187.

Supovitz, J. A., & Christman, J. B. (2003). Developing Communities of Instructional
    Practice: Lessons from Cincinnati and Philadelphia. CPRE Policy Briefs. RB-39.
    Consortium for Policy Research in Education.

Swanlund, A. (2011). *Identifying working conditions that enhance teacher effectiveness:
    The psychometric evaluation of the Teacher Working Conditions Survey*. Chicago. IL:
    American Institutes for Research.

Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics*. Harlow: Pearson
    Education Limited.

Takahashi, S. (2011). Co-constructing efficacy: A "communities of practice" perspective
    on teachers' efficacy beliefs. *Teaching and Teacher Education*, *27*(4), 732-741.

Tasa, K., Taggar, S., & Seijts, G. H. (2007). The development of collective efficacy in
    teams: A multi-level and longitudinal perspective. *Journal of Applied Psychology, 92*(1),
    17–27.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International
    journal of medical education*, *2*, 53-55.

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., & Johnson, D. (2011). Exploring literacy teachers' self-efficacy
    beliefs: Potential sources at play. *Teaching and Teacher Education*, *27*(4), 751-761.

Tschannen-Moran, M., & Woolfolk Hoy, A. W. (2007). The differential antecedents of
    self-efficacy beliefs of novice and experienced teachers. *Teaching and teacher
    Education*, *23*(6), 944-956.

Tschannen-Moran, M., & Woolfolk Hoy, A. W. (2001). Teacher efficacy: Capturing an
    elusive construct. *Teaching and teacher education*, *17*(7), 783-805.

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

Tschannen-Moran, M., & Hoy, A. W. (2006). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and teacher Education*, *23*(6), 944-956.

Van Uden, J. M., Ritzen, H., & Pieters, J. M. (2013). I think I can engage my students. Teachers' perceptions of student engagement and their beliefs about being a teacher. *Teaching and Teacher Education*, *32*, 43-54.

Van Woerkom, M. (2004). The concept of critical reflection and its implications for human resource development. *Advances in developing human resources*, *6*(2), 178-192.

Wahlstrom, K. L., & Louis, K. S. (2008). How teachers experience principal leadership: The roles of professional community, trust, efficacy, and shared responsibility. *Educational Administration Quarterly*, *44*(4), 458-495.

Walker, B. J. (2003). The cultivation of student self-efficacy in reading and writing. *Reading and Writing Quarterly: Overcoming Reading Difficulties*, *19*, 173– 187.

Walumbwa, F. O., Wang, P., Lawler, J. J., & Shi, K. (2004). The role of collective efficacy in the relations between transformational leadership and work outcomes. *Journal of Occupational and Organizational Psychology*, *77*(4), 515-530.

Ware, H., & Kitsantas, A. (2007). Teacher and collective efficacy beliefs as predictors of professional commitment. *Journal of Educational Research*, *100*(5), 303-310.

Wood, R., & Bandura, A. (1989). Social cognitive theory of organizational management. *Academy of management Review*, *14*(3), 361-384.

Wolters, C. A., & Daugherty, S. G. (2007). Goal structures and teachers' sense of efficacy: Their relation and association to teaching experience and academic level. *Journal of Educational Psychology*, *99*(1), 181-193.

Woolfolk Hoy, A. E., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: a comparison of four measures. *Teaching and Teacher Education*, 21, 343-356.

Yuan, Y. C. (2010). Multiple imputation for missing data: Concepts and new development (Version 9.0). *SAS Institute Inc, Rockville, MD*.

Zambo, R., & Zambo, D. (2008). The impact of professional development in mathematics on teachers' individual and collective efficacy: The stigma of underperforming. *Teacher Education Quarterly*, *35*(1), 159-168.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

Zimmerman, B. J. (1995). Self-efficacy and educational development. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 202–231). New York: Cambridge University Press.

Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achievement: An overview and analysis. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (pp. 1–37). Mahwah, NJ: Erlbaum.

Zyngier, D. (2008). (Re)conceptualising student engagement: Doing education not doing time. *Teaching and Teacher Education, 24*, 1765-1776.

Appendix A

Dependent and Independent Variable Scales with Corresponding Codes and Survey Items

Variable	Variable Code	Survey Items
Collective Efficacy in Student Engagement (dependent variable)	CESE	1. Teachers are confident they can motivate students. 2. Teachers in my school have what it takes to get the children to learn. 3. Teachers in this school are able to get through to difficult students. 4. Teachers in my school really believe that every child can learn. 5. If a child doesn't want to learn, something the first time, teachers here will try another way.
Perception of the Use of Performance Feedback (independent variable)	PPF	1. Teacher performance is assessed objectively. 2. Teachers receive feedback that can help them improve teaching. 3. The school leadership facilitates using data to improve student learning.
Perception of Professional Development Opportunities (independent variable)	PPDO	1. Professional learning opportunities are aligned with the school's improvement plan. 2. Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices. 3. Professional development deepens teachers' content knowledge. 4. Professional development is differentiated to meet the needs of individual teachers. 5. Professional development enhances teachers' abilities to improve student learning. 6. Professional development is evaluated and results are communicated to teachers. 7. In this school, follow up is provided from professional development. 8. Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs. 9. Teachers are encouraged to reflect on their own practice.

		10. Sufficient resources are available for professional development in my school.
		11. An appropriate amount of time is provided for professional development.
Perception of School Leadership (independent variable)	PSL	1. The faculty and leadership have a shared vision.
		2. The school leadership consistently supports teachers.
		3. The school leadership makes a sustained effort to address teacher concerns about managing student conduct.
		4. Teachers are held to high professional standards for delivering instruction.
		5. The faculty are recognized for accomplishments.

Appendix B

ALL TWCS: 2009 Variables Initially Examined

Variable	Description	Use
TEACHER_ICPSR	ICPSR teacher identification number	To identify individual data cases in ICSPR virtual data enclave
DISTRICT_ICPSR	ICPSR district identification number	Used to identify the school district in which each respondent is employed
T_MALE	Gender	To identify the gender of TWCS respondent
T_WHITE	Race - White	Background characteristic variable
T_BLACK	Race - Black	Background characteristic variable
T_HISPANIC	Race - Black	Background characteristic variable
T_RACEOTHER	Race - Other	Background characteristic variable
T_MASTERSPLUS	Level of Education	Background Characteristic variable
CESE	Scaled score of collective efficacy in student engagement. 5 items, α = .875	Dependent (Outcome) Variable
PSL	Scaled score of perception of school leadership. 5 items, α = .898	Independent (Predictor) Variable
PPDO	Scaled score of perception of professional development opportunities. 11 items, α = .949	Independent (Predictor) Variable

PPF	Scaled score of perception of performance feedback. 3 items, α = .800	Independent (Predictor) Variable
MPL21ANOTHERWAY, MPL21BELEIVE, MPL21DIFFSTU, MPL21LEARN, MPL21MOTVATE	Scale of collective efficacy in student engagement, 5 items, α = .875	Dependent (Outcome) Variable
LDL21EFFORTSC, LD21SHAREDVIS, LDL21PROFSTDS, LDL21TCHRSUPP, LDL21RECOGACCOM	Scale of collective perception school leadership, 5 items, α = .898	Independent (Predictor) Variable
PDL21ALIGNSIP, PDL21COLLEAGUE, PDL21DEEPEFFECT, PDL21DIFFERENT, PDL21ENHANCE, PDL21EVAL, PDL21FOLLOWUP, PDL21IMPLEMENT, PDL21REFLECT, PDLSUFFRES, PDL21TIME	Scale of perception of professional development opportunities, 11 items, α = .946	Independent (Predictor) Variable
LDL21FDBCKIMP, LDLS21TCHRPERF, LDL21USEDATA,	Scale of perception of the use of performance feedback, 3 items, α = .800	Independent (Predictor) Variable