

Principal Self-Efficacy and Learning Organizations: Influencing School Improvement

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One key characteristic of high-performing schools is how they function organizationally, enabling them to enact reforms effectively and to deal with regular organizational ambiguity and chaos. The principal plays a pivotal role in developing a school culture that supports high-performing schools. This research studies the relationship between principal self-efficacy and a principal's perception of her school as a learning organization. We examined specific subcategories of learning organization attitudes and behaviors to determine whether principals consider distinct organizational behaviors a proxy for indicators of a learning organization, and whether that was related to their self-efficacy. The findings indicate that principals must be highly efficacious to persuade others to perform at high levels, and must have a strong belief in teachers and the organization as a whole to pursue the types of school improvement efforts and research-based organizational learning mechanisms that can improve student performance.

Keywords: principal self-efficacy, learning organization, high-performing schools, school culture

There is clear consensus on the role of leadership on student achievement (Leithwood & Mascall, 2008; Nettles & Herrington, 2007; Goddard, Goddard, Sook Kim, & Miller (2015). Leadership effects studies suggest that school leaders' influence on student achievement is indirect, with more direct influence on teachers and the school organizational structure and functioning (Leithwood & Mascall, 2008; Hallinger & Heck, 1996; Hitt & Tucker, 2016). At the same time, we see more effort placed on assessing principals' work using a variety of indicators including creating a positive culture, maintaining high standards, and rigorous curriculum (Goldring, Porter, Murphy, Elliot, & Cravens, 2009; Deal & Peterson, 2016). These two distinct bodies of work, research on leadership effects and leadership assessment, incorporate dimensions of organizational functioning as critical aspects of school leaders' professional responsibility and regular work. Indeed, one key characteristic of high performing schools is how they function as an organization (Tschannen-Moran & Gareis, 2015), specifically the way they share knowledge and information across the organization, which enables them to enact reforms effectively and efficiently, and deal better with organizational chaos and uncertainty (Thompson, 2017). We know that the school leader plays a central role in cultivating a school environment that supports and enables the type of organizational learning that yield high performing schools (Klar & Brewer, 2013).

While the notion of a school as a learning organization seems like common sense (Senge, 2014), a clear definition of a learning organization remains somewhat elusive. The idea of a learning organization is one in which knowledge and information gets shared and utilized across the school community (Senge, 1991). Yet, scholars continue to work to determine whether to define a learning organization as the presence of certain structures, cultures, or processes that enable organizational learning, or whether these same features emerge because of organizational learning. However, amid this conceptual dilemma, Senge (1995) supports the contention that the principal bears some responsibility to create an environment wherein teachers collectively interpret knowledge and information that shapes organizational values, future organizational functioning, and organizational outcomes.

It may not be enough that principals recognize their role and responsibility to create and restructure organizations for learning and for improvement. Efficacy beliefs are key determinants of human agency, as people must believe they have the power to produce the desired results to attempt to make it happen (Bandura & Wessels, 1997; Takahashi, 2011; Kleinsasser, 2014). Bandura contends that perceived self-efficacy expands the options that leaders consider when they need to make a decision. Conversely, if leaders feel particularly ineffectual regarding some innovation or reform, then they likely disregard it as an option when making decisions. Further, he argues that leaders' beliefs that the environment can be controlled or changed are a means of creating resilient leader self-efficacy (Machida & Schaubroeck, 2011; Abuzid & Abbas, 2016). In other words, when leaders view the organization as changeable, it increases their self-efficacy to manage it, whereas viewing it as unchangeable undermines their efficacy. At the same time, principals' self-efficacy may play a mediating role influencing the principals' interpretation of the organizational context and their problem solving processes, and affect the nature and effectiveness of principals' practices.

This paper discusses a study that explores the relationship between principal self-efficacy and principals' perceptions of their schools as a learning organization. Our basic premise is that principal performance is a function of principal self-efficacy and principal perceptions of the school environment, specifically whether they view their own school reflective of the behaviors and attitudes consistent with a learning organization. For this study, we do not aim to determine the direction of the relationship. Rather, our purpose is to examine whether principals view certain organizational behaviors and attitudes as indicative of a learning organization, possibly relating to

their principal self-efficacy (Calik, Sezgin, Kavgaci, & Cagatay Kilinc, 2012). We posit that organizational attitudes, behaviors, and functioning contribute to the overall organizational efficacy. Further, we believe that it is important for principals to possess positive judgments about their own self-efficacy, as well as organizational efficacy, to effectively enact school policies, reforms, and innovations and deal with organizational chaos and uncertainty (Donnell & Gettinger, 2015). In addition to examining the relationship between principal self-efficacy and learning organization behaviors we examine some specific subcategories of what we believe to be part of learning organization attitudes and behaviors to determine their relationship to principal self-efficacy.

Conceptual Framework

Organizational Learning

The significance of organizational learning to school reform receives support from a broad area of researchers inside and outside of education, and from national and international arenas, even as its meaning continues to be debated and reconceptualized. According to Fiol and Lyles (1985), there are two approaches to learning organizations. First, organizational learning has been described as the development of new insights and understandings that have potential to influence behavior (Fiol & Lyles, 1985; Huber 1991; Sinkula 1994; Sheng & Chien, 2016). Marsick and Watkins (1999) identify several key components of learning organizations, including systems-level, continuous learning that generates and manages knowledge outcomes, and outcomes that lead to improvement in the organization's performance and value. They describe a learning organization as, "one that learns continuously and transforms itself . . . where learning is a continuous, strategically used process" (p. 13).

These definitions situate learning as a dependent variable, meaning that learning as an outcome can be detected or is implied in the shared mental models, causal maps, strategies, etc. which then lead to behavioral outcomes like changes in such things as routines and standard operating procedures (Schechter, 2008). Promoted by Senge in the business literature (Senge, 2014), we also see some application in the education literature that apply this conceptual understanding. For example, organizational learning has been defined as the social processing of knowledge (Marks & Louis, 1999; Hubbard, Mehan, & Stein, 2006) or the sharing of individually held knowledge or information in ways that construct a clear, commonly held set of ideas. In addition, others (Borgatti & Cross, 2003) suggest that organizational learning is more than the collective learning of individuals. Sharing and collaboration, developing a shared vision, and collective processing promote organizational learning.

Another conception of organizational learning suggests that learning is reflected in the structural elements and social arrangements of the organization. In his study, Schechter (2008) views learning as an independent variable, examining the mechanisms that support structural-social arrangements, which promote organizational learning. These organizational learning mechanisms may be seen as the instruments that gather and organize information and put it to use (Schechter, 2008). Evaluation reports, professional development, meetings, curriculum and other concrete structures or processes represent the instruments or mechanisms through which the sharing and the flow of information occurs, hence leading to organizational learning. Indeed, this continues to be a promising approach for the continuing study of organizational learning.

The theoretical model for this study is based in part on Senge's (1990) construct of a learning organization. While this model has been used widely in business contexts, there is significantly less

evidence of its application to school systems. In this study, Senge's model allowed us to frame organizational learning as organizational behaviors and attitudes that may be assessed and judged by school principals. We examined principal self-efficacy along with principals' perceptions of their schools as exhibiting attitudes and behaviors consistent with Senge's construct of a learning organization. We were interested in the degree to which principals believe their faculty work together, share a collective vision, accept innovation and change easily, and recognize the need to improve upon their own skills and competencies. We adapted and operationalized Senge's framework, including mental models, team learning, collective mastery, shared vision and systems thinking, into attitudes and behaviors that could illuminate these elements of a learning organization. Our focus is on the principal's cognitive processing of her own ability to lead and improve schools, relative to her perception of the school's ability to behave in ways that support improvement across the school. We contend that principal self-efficacy and the principal's view of school organizational efficacy has implications for principal performance and ultimately school performance.

Operationalizing Senge's Five Disciplines of a Learning Organization

Kofman and Senge (1993) assert that individuals in learning organizations find personal commitment and a sense of community and demonstrate a high degree of efficacy about people and their potential to effect change in the environment (Beer & Eisenstat, 1996, 2000). Some of the common features described in the literature on learning organizations include purposefully organized conversation, including intense communication (Hargreaves & Fullan, 2012), reflective dialogue (Bryk, Camburn, & Louis, 1999; Seashore Louis & Lee, 2016), persistent inquiry (Newmann & Wehlage, 1995; Rusch, 2005; Cooperrider & Srivastva, 2017), and reflective thinking (Leithwood, Leonard & Sharratt, 1998; Sharratt & Fullan, 2009). Senge (1990) offers five learning disciplines that characterize learning organizations and suggests that together, these disciplines enhance the collective capacity of a group of individuals to collectively pursue organizational goals and outcomes. We use them to help us conceptualize the ways in which the principal might perceive the faculty's collective thinking and functioning, which can be viewed as important characteristics of school environment and organizational efficacy, and which likely mediate principal self-efficacy. In the section that follows, we define each of these components, and discuss how they may be operationalized as features that exemplify schools that function as learning organizations.

Senge (1992) describes mental models as an individual's set of assumptions and mental images that influence one's understanding of the world, as well as the actions taken as a result. Learning which changes mental models is immensely challenging. He suggests that these models are indelibly woven into who we are as individuals, complete with a full complement of our own personal experiences (Senge, 2000). They are often hidden securely from view in schools, often being among the "undiscussable" topics. Mental models must undergo significant change to accomplish systemic institutionalized change, not simply the reorganization of the framework and the structure. A learning organization works to develop a productive conversation about such previously uncomfortable topics. At the school organizational level, mental models may be thought of as tacit, taken-for-granted assumptions and knowledge that reflect what teachers and administrators think about their teaching practice and school functioning. In this study, we conceptualize a school's use of mental models by determining whether the faculty functions in ways that acknowledge the tension between what they do and what they know they should do. In other words, we assume that principals can perceive whether teachers acknowledge the potential discrepancy between some notions of "real" and "ideal" educational practice.

Shared vision is the ability to hold a shared image of the future, which a group seeks to create collectively. It involves “unearthing shared ‘pictures of the future’ that foster genuine commitment and enrollment rather than compliance” (Senge, 1990, p. 9). The idea is that a school or school system should develop a shared vision against which all decisions are measured. This notion of shared vision is consistent with other literature that situates its development as part of the school leader’s role and responsibility. It seems reasonable that the degree to which the principal perceives that the faculty members share a vision would reflect on her ability to develop the vision with faculty and communicate it across the school community. Shared vision suggests some acknowledgement of agreement on collective beliefs about the challenges and goals for what could be accomplished in the future.

The discipline of learning together is referred to as team learning. Through such strategies as skillful discussion and dialogue, small groups of individuals begin to transform their collective thinking, using their energies to achieve common goals with an ability to finesse greater than the sum of the individual members’ talents (Senge, 2000). “Dialogue” refers to the capacity of members of an organization to suspend assumptions and enter into genuine “thinking together” (Isaacs, 1999; Howe & Abedin, 2013; Howe, Hennessy, Mercer, Vrikki, & Wheatley, 2019). While it seems that is the principal’s job to develop structures that enable team learning, the degree to which they receive district support or resistance would be an important factor. Further, principals need to convince faculty of the value of collaboration and professional community to effectively foster an environment for team learning. For this study, we asked principals to conceptualize team learning based on whether teachers work together, share information and knowledge, make decisions together, and develop new strategies that lead to innovation.

According to Senge (1990), systems thinking refers to “...a shift of mind from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something ‘out there’ to seeing how one’s own actions create the problems we experience” (p. 12). We conceptualize systems thinking as the way in which a faculty considers the interconnectedness between themselves and various components of the school community, as well as organizational functioning. In other words, we asked principals to assess whether teachers view themselves as part of the broader system, and how what they do influences school functioning as a whole, as well as the future of the students and communities they serve. Systems thinking is related to both shared vision and team learning (Senge, Cambron-McCabe, Lucas, Smith, & Dutton, 2012; Stalter, Phillips, Ruggiero, Scardaville, Merriam, Dolansky, & Winegardner, 2016), either as a prerequisite or consequence.

Finally, collective mastery describes the development of a faculty’s capacity to learn and perform. Senge sees personal mastery as a cornerstone of the learning organization, since an organization’s capacity for learning can be no greater than that of its members (Senge, 2014). Others suggest that organizational learning does not represent the collective learning of individuals; rather it is collective processing of knowledge that promotes organizational learning (Schechter, 2005). For the purposes of this study, we asked principals to assess the collective knowledge and skills of their faculty as a whole, and whether the faculty work together to improve their collective capacity for leadership and teaching.

Taken together, principals develop some notion of their school organization’s capacity and willingness to learn via their perception of these disciplines (or attitudes and behaviors). We contend that they represent, at least in part, the principal’s view of organizational efficacy. Along with principal self-efficacy, the principal’s view of her school as a learning organization may be a powerful indicator of principal performance, which may subsequently affect student performance

and school improvement. Principals must assess themselves and their schools as capable and able to enact the necessary structures, policies, and practices to support the improvement of teacher and student learning. These judgments directly impact principal decision-making and performance. In this study, we examined the construct of principal self-efficacy and its importance to principal performance and organizational learning.

Self-efficacy - A Critical Factor in Principal Performance

The purpose of this study was to examine the relationship between principal self-efficacy and principals' perception of their school as a learning organization. While this relationship is likely reciprocal in nature, we suggest that principals' views of their schools as learning organizations may provide some indication of whether they see their schools as changeable and adaptable, which then affects principal self-efficacy and subsequently, principal performance. In other words, principals who work in adaptive school environments likely deem themselves as more capable or efficacious in dealing with school complexity. Bandura (1986; Stajkovic, Bandura, Locke, Lee, & Sergent, 2018) contends that an individual's self-efficacy includes beliefs about one's own capabilities, which then shape thoughts, emotional states, and actions in response to challenging situations. Further, individuals possess and receive information from the environment that shapes their efficacy beliefs. For example, researchers Wang, Hall, and Rahimi (2015) suggested that causal attributions significantly contribute to perceived self-efficacy. According to Chwalisz, Altmaier, & Russell (1992), individuals evaluate events based on their general beliefs about the locus of control. Their beliefs about internal locus of control (events depend upon one's own behavior) or external locus of control (events depend upon factors such as luck, fate, or other people) affect their primary appraisal and the subsequent causal attributions assigned to events. A secondary appraisal involves an individual's evaluation of their own interaction with events and the environment; this shapes both self-efficacy and behavior. If a person or the group decides that the causes of events or features of the environment they face are beyond their control, then such an appraisal affects their efficacy, which in turn affects their response to these events.

Bandura (1993; Stajkovic, Bandura, Locke, Lee, & Sergent, 2018) listed sources of information that shape self-efficacy, in addition to causal attributions. The first source of efficacy information, mastery experience, refers to the enactive experiences that people have, representing their successful or unsuccessful performance. It is important here to note that it is not the actual successful or unsuccessful performance that affects efficacy. Rather, mastery experience shows not only whether individuals have the requisite skills to perform, but also indicates their perception of control in the use of those skills. Mastery experience is the most influential source of efficacy information because, “[successful acts] provide evidence of whether one can muster whatever it takes to succeed” (Bandura & Wessels, 1997, p. 80). For this reason, past success tends to persuade people that they have what it takes to succeed, thus raising their efficacy. Conversely, perceived failure tends to undermine efficacy. A second source, vicarious experience, refers to what schools learn from other schools or what teachers learn from other teachers. As Bandura (1997) suggests, “There are no absolute measures of adequacy” (p. 86) and therefore, people must judge their performance in relation to the norm or to similar organizations. He suggests that vicarious experience can often override the direct experience of failure, since the modeling may convince people of their power and ability to overcome challenges, even in the face of repeated failures.

The affective state (Hoy, Sweetland, & Smith, 2002; Tschannen-Moran & Gareis, 2015) describes another source of efficacy-shaping information which includes the way schools respond

to or tolerate crises or pressures. Referring to self-efficacy, Bandura (1993; Stajkovic, Bandura, Locke, Lee, & Sergent, 2018) suggested that people who believe they can exercise control over potential events and situations do not conjure up calamities and frighten themselves. Conversely, people who perceive conditions as unmanageable view the environment as fraught with danger. He argues that such ineffectual thought constrains and impairs their level of functioning (Bandura & Wessels, 1997). As a person's sense of efficacy grows stronger, she becomes more courageous and confident in dealing with difficult circumstances, recasting them in ways that appear more manageable. Finally, social or verbal persuasion pertains to the training, talks, workshops, faculty lounge conversations, leadership, and other types of information that teachers may receive about their collective abilities, potential, and performance. Verbal persuasion occurs when significant others express faith in one's abilities and capabilities (Bandura & Wessels, 1997; Tschannen-Moran & McMaster, 2009). Thus, the more believable the source, the more probable efficacy judgments are likely to change.

Along with attributions and the sources of efficacy information, a perception of self-efficacy also involves an analysis of the task at hand. Included in this task analysis is some judgment of what the task requires, the factors that constitute "success" or could inhibit success, and the context, materials, and resources required for success. It is feasible that a person can perceive herself to be efficacious with certain tasks or with certain students and feel completely ineffectual with other tasks and other students. This analysis includes an appraisal of one's own or others' collective knowledge, skills, training, and the potential to receive necessary training (Bandura & Wessels, 1997; van den Berg, 2002).

Why Principal Self-efficacy Matters to Principal Leadership and Organizational Learning

The principal is in the position of having the view of the school organization as it currently is, and for what she ideally would like it to become. Both assessments require her to make several judgments. First, principals must view the school organization as changeable; they must believe that with certain organizational structures, personnel, beliefs, values, and culture, the school organization can facilitate high achievement in students and teachers. Second, they must see school improvement and student achievement as their professional responsibility, even as schools face multiple internal and external demands, understanding that the characteristics and conditions of students, families, and communities can significantly influence school and student outcomes. Finally, principals must view themselves as capable of facilitating the needed changes. In other words, they must view themselves as having the requisite skills, knowledge and dispositions needed to lead an organization towards the improved functioning that supports improved student learning.

Central to these three judgments, however, is the matter of autonomy and control. The complexity of schools as organizations and institutions place a variety of environmental demands on schools and the principals who lead them. While principals exert direct control over many aspects of schools, they do not have direct control over teaching. The degree to which they feel autonomous will vary, based on district and school organizational structures. In any case, school goals can only be achieved through the concerted, collective efforts of individuals other than the principal. This means that many of the decisions that principals must make involve ways to utilize others' knowledge and talent, and how to guide, motivate, persuade and coerce them to perform. Additionally, they must determine when and when not to relinquish control to others (Bandura & Wessels, 1997).

Bandura & Wessels (1997) offer some perspective on the importance of leader self-efficacy. First, they suggest that leaders with low self-efficacy may be unable or ineffective to persuade others to perform in certain ways and that they may exhibit faulty judgment on when to relinquish control. Further, low principal self-efficacy may lead them to use teacher autonomy as an excuse for the principal failing to exercise personal control when she should. Finally, Bandura & Wessels (1997) suggest that people who judge themselves ineffectual in managing the school environment and its multi-faceted, complex demands may be more self-diagnostic than task diagnostic. This leads principals to think more self-protectively and less strategically. Conversely, those who consider themselves efficacious in managing their school are likely to continue to be more analytic in their thinking. This analytic or self-protective thinking leads to a particular mode of decision-making, in part because self-efficacy affects the type of information collected, how it gets interpreted and how it is converted into strategies for managing school challenges. Effective leadership requires receptivity to innovation and change that can improve the quality of the organization. High self-efficacy helps principals to override the variety of disincentives that can discourage the implementation of innovation (Bandura & Wessels, 1997). Factors that influence self-efficacy beliefs, including causal attributions, mastery experience, affective state, and verbal persuasion, all point to the context-specific nature of self-efficacy. In other words, the degree to which principals judge their self-efficacy depends on the context in which they work, the tasks they need to perform, and the goals they need to meet.

Several studies show that elements of the school environment can affect the efficacy beliefs of school principals (Dimmock & Hattie, 1996; Osterman & Sullivan, 1996; Tschanen-Moran & Gareis, 2007; Leithwood & Jantzi, 2008). Osterman and Sullivan (1996) and Scheurich (1998) found that the structural and cultural characteristics and role descriptions of new principals in urban schools influenced their leadership practices. Essentially, principals' self-efficacy played a mediating role, influencing their interpretation of the organizational context and their problem solving processes, and affected the nature and effectiveness of principals' practices. At the same time, these studies also suggest that high- and low-efficacy principals differ in their perception of the school environment. While school socioeconomic status, academic performance, or school size did not influence principal self-efficacy, variations in personal and organizational experiences did influence efficacy. The high-efficacy principals viewed themselves as part of an extensive support network within and outside the district. Conversely, low-efficacy principals did not see themselves as part of a collective effort, and were less clear about expectations. In addition, high-efficacy principals believed that organizational climate facilitated their efforts. They viewed teachers and others in the school as supportive. Other scholars (Leithwood & Jantzi, 2008; Paglis & Green, 2002; Carleton, Barling, & Trivisonno, 2018) analyzed a number of possible antecedents to leader self-efficacy. Paglis & Green (2002) showed that job autonomy and subordinates who are open to change influenced leader self-efficacy.

In summary, there appears to be a relationship between an individual's organizational perceptions and self-efficacy judgments. While we traditionally think of the principal's influence on the school organization, these studies show that the school organization also affects the principal, thereby altering the principal's perceptions of the organization and ultimately affecting her ability to lead. Leithwood and Jantzi (2008) found that principal self-efficacy was highly correlated with principal behavior. They found that principals' perceptions of their own abilities influenced their behavior relative to developing people within the school, setting the direction of the school, managing instruction, and redesigning the organization. They also found weak but significant effects of leader efficacy on one indicator of student learning - the proportion of students meeting

or exceeding standards. This study and others (Imants & DeBrabander, 1996; Tschannen-Moran & Garies, 2007; Tschannen-Moran & Hoy, 2007; Jacob, Goddard, Kim, Miller, & Goddard, 2015) support the idea that principal self-efficacy may be an important aspect of school and student performance.

Self-efficacy is context-specific (Tschannen-Moran & Gareis, 2007; Carleton, Barling, & Trivisonno, 2018). Studies suggest that external factors, such as those in and pertaining to the school organization, interact with mental processes and the cognitive state of leaders to affect the nature and effectiveness of principal practice (Leithwood & Jantzi, 2008; Osterman & Sullivan, 1996). It appears that the principal's assessment of organizational efficacy, including her perception of the school as a learning organization, influences principal self-efficacy and their subsequent performance. An assessment of organizational efficacy suggests to the principal that the school values, culture, structure, and collective behaviors and attitudes will enable the school to reach its goals. To effectively manage and improve schools, principals must believe not only in their own ability and capability, but also in their teachers' and organizational efficacy.

High self-efficacy enables principals to lead and facilitate organizational learning by assisting teachers to perform their various tasks and facilitating the exchange of ideas between the various systems in the school. Researchers (Silins, Mulford & Zarins, 2002; Li, Hallinger, & Ko, 2016) examined the nature of organizational learning and the leadership practices and processes that foster organizational learning in Australian high schools. They characterized organizational learning as a trusting and collaborative climate where individuals take initiatives and risks, share and monitor vision, and actively engage in professional development. They determined that organizational learning was related to the total level of leadership in the organization, which included a principal's transformational leadership and distributed leadership. Leithwood, Leonard & Sharratt (1998) and Hallinger and Heck (2010) found that among all conditions that support organizational learning in schools, transformational principal leadership was most impactful.

Rusch (2005) discussed the difficulty in forging the necessary networks and complex professional talk needed to support organizational learning in school systems, particularly at the district level. In this study, she found that principals who participated in engaged network and professional talk with other administrators showed increased efficacy about their teachers' learning capacity, though it did not translate into principals' changed beliefs about organizational learning across the school district, which was viewed as a potential barrier to school-level learning. Due to the interrelatedness of school systems and subsystems, both communication and social networks must be purposefully in place in order for organizational learning to occur (Jenson & Moller, 2013). For this study, we examined principal self-efficacy and aspects of learning organizations that focused on the degree to which principals believed their faculty displayed the requisite behaviors and exemplified the necessary attitudes and values that support the exchange of knowledge and information deemed to be important to organizational learning.

Methods

This study investigated the relationships between school principals' self-efficacy and their view of the school as a learning organization. Approximately 3,300 PK-12 school principals from across geographic and urbanity designations in a midwestern state were invited to participate in this study. They were asked to respond to a form of the *Principal Self-Efficacy Survey* (PSES) (Tschannen-Moran and Gareis, 2004), and the *Learning Organization Inventory* (LOI) (Author, 2001). Respondents completed the *Principal Self-Efficacy Survey* (PSES), an 18-item instrument used to

measure self-reported self-efficacy. This instrument, adapted with permission from Tschannen-Moran and Gareis (2004), assesses a principal's judgment of her own ability to manage the school organization, lead instruction, and establish a learning environment. The instrument also measures three subscales identified by Tschannen-Moran and Gareis (2005) that are elements of principal self-efficacy: efficacy for moral leadership, efficacy for instructional leadership, and efficacy for management.

The *Learning Organization Inventory* (LOI) (Author, 2001) is based on behaviors that reflect each of Senge's (1990) five disciplines as components of a learning organization. This 25-item survey was designed to generate responses that indicate the degree to which a principal perceives the presence of learning organization behaviors and attitudes ("disciplines") in the school. In the initial part of the LOI survey, statements reflect characteristic behaviors of individuals or teams in learning organizations. The participants responded to a 5-point Likert scale, rating responses on a continuum, with 1 being "strongly agree" and 5 being "strongly disagree." We examined the five subscales based on the integral components of learning organization behaviors and attitudes, specifically mental models, team learning, collective mastery, systems thinking, and shared values. The study was guided by the following research question:

What is the relationship between principals' self-efficacy and their perception of the school as a learning organization, as framed by Senge's five disciplines?

Data Collection and Sample

In response to a Freedom of Information Act request, the state board of education provided email addresses for every school principal in the state. We emailed an introductory letter to each principal, explaining the study and asking for their voluntary participation. In a follow-up email, we provided each principal with the web link to the online survey, which included a consent form. Because this was an electronic survey, we took special steps to minimize human subject risk to the respondents. A participant could freely discontinue the protocol at any time, without fear of repercussions. If a participant elected to skip any question, the survey indicated that as a non-answer. They were assured in writing that their responses would be confidential; an explicit confidentiality statement to this effect was made in the cover letter that was attached to the survey.

Following the completion of the PSES-LOI survey questions, we requested (but did not require) personal and school-specific demographic information, including the participant's gender, race and years of experience as a principal, student demographics and standardized test scores in math and reading for the participant's school. Each was asked to provide school-level, aggregate student achievement data from the most recent three years of standardized state tests. These data are received annually from the state board of education, and are also publicly available on various state, district, and school websites. Participants were given the option of providing identifying information such as their name, email address and/or school name and address. If provided, this information was used to link their responses to their school's publicly accessible academic data. This information allowed us to aggregate and analyze by school type (e.g., urban, suburban, rural; elementary, middle, or high school) and other information (e.g., school size, student demographics). Individual data were not used. All data were collected using the online instrument; data accessibility was limited to the researcher and kept confidential.

Results

Our data analysis includes a sample of 778 principals who completed and submitted the assessments. After we determined the descriptive statistics (Table 1), we conducted Cronbach's alpha reliability tests (Table 2), seeking possible relationships between the data sets. Tests were run on the Principal Self-Efficacy Scales composite (PSES) and its three subscales (Efficacy for Management, Efficacy for Instructional Leadership, and Efficacy for Moral Leadership), as well as the Learning Organization Inventory composite (LOI) and its five subscales - Mental Models (MM), Shared Values (SV), Collective Mastery (CM), Team Learning (TL), and Systems Thinking (ST). While both composites for PSES and LOI were found to be reliable (.885 and .887 respectively), several of the subscales were less reliable. This suggests the need to more closely examine the survey instrument for possible issues in wording or meaning (Nunnally, 1978).

Table 1
Descriptive Statistics of Respondent Principals (n=778)

Gender	N	Percentage
Male	357	46
Female	415	53
School Type		
Elementary Principals	515	66
Middle School Principals	131	17
High School Principals	122	16
Principal Race		
African American	96	12
White	631	81
Hispanic	31	4
Asian	6	0.7
Other	6	0.7
School Locale/Urbanicity		
Urban	147	19
Suburban	317	41
Rural	116	15
Mid-sized city	86	11
Small town	108	14

Table 2
Reliability tests on the Principal Self-Efficacy Scales composite (PSES) and its three subscales, Learning Organization Inventory composite (LOI) and its five subscales (n=778)

	Min.	Max.	<i>M</i>	<i>SD</i>	A
PSES composite score	3.28	6.00	5.0574	.47	.885
Efficacy for Management	2.00	6.00	4.7811	.68	.81

Efficacy for Instructional Leadership	2.50	6.00	5.1590	.55	.85
Efficacy for Moral Leadership	3.00	6.00	5.2322	.51	.79
<i>LOI composite score</i>	2.32	4.92	4.0133	.38	.887
Mental Models	1.60	5.00	3.6147	.39	.60
Shared Vision	2.20	5.00	4.1406	.51	.77
Collective Mastery	2.80	5.00	4.0586	.38	.55
Team Learning	2.20	5.00	4.1550	.53	.66
Systems Thinking	2.00	5.00	4.0974	.48	.89

Correlations were conducted on PSES, LOI and all subscales of both instruments (Table 3). There was a significant relationship between principal self-efficacy and their perception of their school as a learning organization ($r = .584$). This finding suggests that the way in which a principal judges her own abilities and capabilities relates to the ways in which she perceives their school organization as exhibiting behaviors and attitudes consistent with a learning organization. No causal direction can be determined, though other studies suggest that organizational efficacy and/or school environment serves as an antecedent to principal self-efficacy (Tschannen-Moran & Gareis, 2007). In those studies, principals' self-efficacy is mediated by how they interpret their school and its subsystems and its organizational efficacy. Conversely, if principals are unable to view their organizations as changeable, this may lead to low principal self-efficacy, which then leads to failure to innovate, to implement reform, and may result in ineffective management. In addition, we found significant relationships between principal self-efficacy and systems thinking ($r = .551$) and shared values ($r = .552$), team learning ($r = .443$), and collective mastery ($r = .455$), and a significant but weaker relationship between principal self-efficacy and mental models ($r = .375$). It is reasonable to assume that principals may be better able to judge such features as shared vision or team learning more readily than they can judge the use of mental models among their faculty.

Table 3
Correlations

	PSES	LOI	MM	SV	CM	TL	ST	Eff_Man	Eff_Ins	Eff_Mor
PSES composite score	1.000	0.584	0.375	0.552	0.455	0.443	0.551	0.808	0.829	0.803

LOI composite score		1.000	0.747	0.897	0.760	0.823	0.856	0.455	0.636	0.359
Mental Models composite score			1.000	0.612	0.493	0.475	0.562	0.202	0.443	0.294
Shared Vision composite score				1.000	0.595	0.661	0.761	0.367	0.574	0.423
Collective Mastery composite score					1.000	0.554	0.547	0.284	0.488	0.356
Team Learning composite score						1.000	0.600	0.244	0.518	0.346
Systems Thinking composite score							1.000	0.361	0.568	0.434
Efficacy for Management								1.000	0.453	0.419
Efficacy for Instruction									1.000	0.618
Efficacy for Moral Leadership										1.000
**All correlations were significant at $p < .01$ level (2-tailed).										

The LOI composite was significantly correlated to the subscales of principal self-efficacy. Specifically, it is more strongly related to their self-efficacy of instruction (.636) and less strongly related to their self-efficacy related to managing the school (.455) and moral leadership (.359). We hypothesize that if a principal views her school as exhibiting attitudes and behaviors of a learning organization, this is likely to support her view of the school as changeable, which would support and enhance her efforts as an instructional leader. We looked at the relationship between demographic indicators and these measures through analyses such as correlations and ANOVA. While there were no significant differences between elementary, middle school, and high school principals in terms of principal self-efficacy, the LOI mean for high school principals was significantly different than means for both the elementary and middle school principals. Overall, high school principals tended to give lower ratings to the items than the elementary or middle school principals.

Principals with more years of experience scored higher means on PSES and LOI and their subscales. The latter suggests that a principal's self-efficacy and her perceptions of the school as a learning organization improves with experience, as these principals develop mastery experience which indicate their ability and confidence to lead a successful school. Another possibility could be that experienced principals may be more socialized by their school context, thereby normalizing their perceptions of themselves and their schools. Finally, these data suggest that novice principals with relatively lower self-efficacy may not have such rosy perceptions of their schools or may be realistic about the school's challenges and expected outcomes.

Discussion and Recommendations

From these findings, it appears that the degree to which principals perceive their schools as exhibiting behaviors and attitudes consistent with organizational learning affects the ways in which they judge their own abilities to perform. This may be explained by the fact that principal self-efficacy would likely be higher because they see the school environment as changeable and adaptable, and that they perceive that they actually have some control over it. The findings also indicate that high principal self-efficacy may be associated with a collaborative school climate and shared vision, which enhances the quality of interactions in school and facilitates resource exchange, particularly information needed in learning organizations (Osterman & Sullivan, 1996). We know that self-efficacy beliefs are malleable, and information can alter efficacy perceptions (Bandura & Wessels, 1997; Osterman & Sullivan, 1996; Lee, Patterson, & Vega, 2011). If the school faculty enacts the appropriate behaviors and attitudes within the necessary structures and mechanisms, the school organization embodies the capacity to learn.

This study reflects the need to consider the significance of schools as places of work for principals. So much emphasis and attention is placed on what principals need to do with, in, and for schools, yet little attention is placed on how schools and districts affect the ways in which principals perform. This study shows that principals need not only networks of support and communication inside the school with teachers as part of a professional community, but as Rusch (2005) suggests, they also need similar professional communication and supports at the district level. This study clearly demonstrates that principals must operate through others to accomplish personal and school-level goals. They must be highly efficacious to persuade others to perform at high levels and must have a strong belief in teachers and the organization as a whole to pursue the types of school improvement efforts and research-based organizational learning mechanisms that can improve student performance.

We recommend two strands of research on principal self-efficacy and organizational learning for future study to expand upon these findings, as principals' beliefs, attitudes, and judgments mediate their perceptions of organizational efficacy (and visa versa) and principal performance. Further research might include an analysis of student learning outcomes, as principal efficacy, teacher efficacy and organizational efficacy all are presumed to impact the educational experiences and learning outcomes of students. Disaggregating such a study by urbanicity may provide important learning for context-specific leadership preparation. More research that examines organizational learning mechanisms (Schechter, 2008; Amitay, Popper, & Lipshitz, 2005; Kurland, Peretz, & Hertz-Lazarowitz, 2010) would be useful to identify those frameworks needed to enable the exchange and applicable utility of information. We believe that efficacy at all levels would ensure the effective and efficient use of these organizational learning mechanisms, which support a school's ability to improve teaching and learning.

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